BRAND PERSONALITY TRAIT MARKING USING NONVERBAL MEASUREMENT

By

JAMES A. GEASON

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James A. Geason

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James A. Geason

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The study investigates the viability of using the Self Assessment Manikin (SAM) as a nonverbal instrument for measuring the personality dimensions of agreeableness, surgency and emotional stability as they relate to brand personality.

Respondents were selected from a national panel maintained by National Family Opinion Research. Participants in the study rated five nationally known brands using the Goldberg 50 item semantic scale and the nonverbal SAM scale.

Factor analysis and structural equation modeling were used to test the appropriateness of the scales and the model for the measurement of brand personality.

Results were significant and indicate the SAM characters can be used to mark these three personality traits as they relate to brands.

CHAPTER 1
INTRODUCTION/NEED FOR PRESENT STUDY

Unlike the 18th century, which saw little or no mass production capability, around 1900 manufacturing became more efficient. Surpluses of goods began to develop and the basic problem facing business shifted from one of "how to produce products" to one of "how to distribute products."

The 1920s saw the problem change again, this time from a problem of "supply" to a problem of "demand." Mass production and mass distribution were in place. There was an abundance of product. The problem now was to convince consumers to buy what was available. Therefore, the 1920s ushered in the era of selling. Businesses used intense selling techniques. Deceptive and extravagant claims about products were made in advertising. High-pressure sales tactics were common.

Because of the shortages created during World War II, during the late 1940s and early 1950 businesses had no trouble selling whatever they made. Consumers, long deprived of necessity as well as luxury items, released their pent-up demand for goods. However, by the late 1950s consumers were becoming more sophisticated. They were becoming "particular" about product features and product quality. In addition, they wanted more choice. They wanted what "they wanted," not what manufacturers happened to produce and wanted to sell.

During the late 1950s and early 1960s, company research and development departments were concerned with developing products that were "bigger and faster"; not much thought was given to consumer needs. However, as each decade has passed consumers have become more sophisticated, more knowledgeable and more aware of the product alternatives available. During this same time the marketplace has been crowded with dozens of brands in every product category.

As the pace of invention and technological improvement has slowed, manufacturers have begun to seek ways to differentiate both products and consumers. Markets have become narrow, more vertical. Market share is smaller and competition more intense. These facts have focused research attention to all aspects of the consumer-product relationship. Almost every method imaginable has been used to segment consumer markets. Geography, age, gender, socio-economic status and ethnic background have all been somewhat successful. More recently, marketers have begun to profile consumer personalities in an effort to differentiate buyers. Researchers have attempted to relate a variety of marketing variables to various theories of personality. At best, the results of these studies have been mixed with most studies demonstrating a weak relationship between consumer personality and market behavior. Various consumer personality measures have all been linked to product usage (Cohen, 1967; Tucker and Painter, 1961), decision behavior (Kernan, 1968; Westfall, 1962), purchase behavior (Koponen, 1960), brand loyalty (Brody and Cunningham, 1968), innovative buying behavior (Bruce and Wilt, 1970; Donnelly, 1970), response to advertising and design features (Holbrook, 1986; Wright, 1975), and product acceptance and rejection (Dolich, 1969).

In a natural outgrowth of consumer personality studies, the personalities of the products themselves are now being investigated. Martineau (1957) was one of the earliest researchers to discuss the product personality concept. Vitz and Johnson (1965) found a relationship between smokers' perception of cigarette image and the masculinity and femininity of the smoker. In another study, Dolich (1969) investigated the relationship between self-image and brand preference and found that favored brands were consistent with self-concept and reinforced it. Ackoff and Emsoff (1975) studied four commercials created for four brands of Anheuser-Bush products. Each commercial was produced with a specific personality of the consumer in mind. The results indicated that most consumers selected the brand of beer that fit their personality. This was true although the beers were identical except for the image created by the advertising. Thus, the product personality created by markers was shown to have a strong relationship to the personality type of the consumer.

Theories of consumer-brand interaction are open to much question and debate. One author, Upshaw (1995), states that a common misconception of marketers is that the brand is positioned against other brands in the product category. He maintains that brands are positioned within the mind of the prospect, with the help of prompts from the marketer. Positioning is "a continuous rethinking process usually initiated by the marketer and consummated by the prospect" (p. 121). If consumers imbue brands with human traits, researchers can ask a series of new questions about the relationship. Which of the human personality traits are or are not transferred to brands? What characteristics of the brand trigger anthropomorphic responses from consumers? How is this process of personality attribution carried out? Can marketers manipulate the personality of a brand advantageously?

Burke (1994) states that a

> sound brand proposition properly and consistently communicated 1) builds brand equity by generating acceptance of the company's brand position, 2) creates a recognizable environment for all consumer communications, 3) imparts stronger

> imagery to all projects and product lines, 4) differentiates brand from the competition, 5) increases the impact of individual communications, 6) increases the impact of the total communications effort, and 7) enables the company to command a premium for its products. (p. 20)

Aaker, Batra and Myers (1996) point out, it is the "hard" (functional) and "soft" (symbolic) impression solicited in the buyer's mind by the brand's name, packaging, and symbols that create the brand's personality (p. 338).

Solid brand personality would be a valuable company asset. Reliable, valid quantification of personality within and across brand categories would lead to an even greater valuation of brand equity.

However, there is no universally accepted instrument or scale for measuring brand personality. Various methodologies have been applied, each creating the necessity for individual interpretation (Plummer, 1985). When these studies are compared disconnected scales must be considered with great caution. Without a consensus on the nature and components of brand personality no standardized instrument can be developed. Without standardized measurement, no baseline can be established and thus there is no way to assess similarities, differences or changes in personality.

Using an already existing personality test to measure the personality of brands would be of benefit for many reasons. First, the personality tests in wide use today are firmly grounded in accepted theory. Second, a commercially available test would have a high degree of reliability and validity (some of the tests in wide use today trace their history back to the 1940s, with dozens of studies investigating their theoretical and practical soundness). Third, a personality test in broad use would have norms and scales allowing for the interpretation of test results across various segments of the population.

The ideal instrument would be a projective test that (1) could be administered to consumers in the general population; (2) was able to assess the personality of a wide spectrum of brands; (3) would be quick and easy to administer; (4) had directions understandable by the "average" consumer; (5) had a basis in accepted personality theory; (6) had evidence of reliability and validity documented through replicable research; (7) had evidence available or referenced in the test manual; (8) measured the normal dimensions of personality; and (9) provided a means for interpretation of test scores across the general population.

The section on personality tests in *Mental Measurement Yearbook* lists nearly 400 personality tests. The section includes

> Tests that measure individuals' way of thinking, behaving, and functioning within family and society. Included here are projective and apperception tests, needs inventories, anxiety/depression scales, tests assessing substance use/abuse (or propensity for abuse), risk taking behavior, general mental health, emotional intelligence, self-image self-concept self-esteem, empathy, suicidal ideation, schizophrenia, depression/hopelessness, abuse, coping skills/distress, eating disorders, grief, decision-making, racial attitudes; general motivation, attributions, perceptions; adjustment, parenting styles, and marital issues/satisfaction. (Plake & Impara, 2001, p. 1434)

Initial review of the titles revealed 22 tests having potential applicability in the study of brand personality. Evaluation of the tests based on the nine criteria discussed previously reduced this list to four titles.

The Adjective Check List. The ACL is of particular interest here because it was originally designed "for use by observers in describing others." The test is further described by the authors as being useful in the characterization of "a commercial product." The Adjective Check List was designed to measure the normal dimensions of personality (making it much more useful than a test designed to measure deviant personality types) and the method was normed on a sample of approximately 10,000 subjects.

There appear to be two limitations to using the test to assess brand personality. First, the sheer number of adjectives used in the administration of the test (300) could cause subjects to become confused and fatigued. The high number of responses also increases the difficulty of scoring the test. Second, it appears that the test would be biased against respondents with poor reading skills (Murphy, 1994).

The Myers-Briggs Type Indicator. The MBTI is a candidate for use in a study of brand personality because of the stated purpose of the test, "To identify, from self-report of easily recognized reactions, the basic preferences of people in regard to perception and judgment, so that the effects of each preference, singly and in combination, can be established by research and put to practical use." The test has been widely used and is generally accepted as an indicator of the personality characteristics of C. G. Jung.

One possible drawback to using this test as a tool in the investigation of brand personality is the length of time required for administration. The Burros Mental Measurement Tests reports the length of time necessary to complete the test as 30 to 40 minutes. In addition, this is a "self-report" tool. The validity of the MBTI as a projective test has not been established. However, with 50 years of study and use the test has the advantage of much supporting documentation, including a large bank of descriptive phrases associated with each of the personality types (Murphy, 1994).

The Guilford-Zimmerman Temperament Survey. First published in 1949, the GZTS is another test with an established record of use and critical evaluation. The GZTS has been used in over 500 studies and consequently much is known about the reliability and validity of the instrument. Supporting material for the test includes a booklet containing an interpretation system to assist in preparing reports based on GZTS scores.

However, the time necessary to administer the test appears to limit its usefulness in the study of brand personality. The Guilford-Zimmerman Temperament Survey is a 300-item inventory and requires approximately 45 minutes to administer. It is easy to imagine a situation where respondents become careless and uninterested during the administration of this test. The number of items would make tabulating the results of a wide scale administration cumbersome. Alternatively, the use of computer scoring forms or "bubble-sheets" could prove to be an obstacle for some respondents. As with the other tests discussed the GZTS is biased against persons with limited language ability (Murphy, 1994).

Revised NEO Personality Inventory (NEO-PI-R). The test is based on the five-factor model of personality. This construct has been used in the study of personality for over 50 years. The NEO-PI-R assesses the domains of the five-factor model neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). The test provides scores for these five domains as well as six sub-scale facet scores for each domain. The NEO-PI-R is available in a self-report and an observer-report version as well as a short form of the test. A shorter version of the self-report instrument (the NEO-FFI) has also been developed. Respondents can complete this assessment in 10 to 15 minutes. Separate NEO-PI-R questionnaires are also available for men and women. Norms are based on a sample of 1000 respondents. These subjects were selected from three large-scale studies of the NEO-PI-R and the sample was stratified to match 1995 US census projections for age, gender and ethnicity. Extensive documentation is available in the test manual. The manual contains information on both the long and short version of the test and a bibliography of research on the NEO inventory. The manual also contains information of the history, theory and application of the five-factor model of personality.

Scoring procedures include details for assessing a variety of response biases including random response, acquiescence and nay saying. There is also a three-item validity check for honesty and accuracy in the completion of the questionnaire. The validity of the instrument seems to have been well established by many authors including a series of studies on construct, convergent and divergent validity conducted by the authors of the test, Costa and McCrae.

However, the long form of the NEO-PI-R takes 30 to 40 minutes to administer and, as was the case for the other test candidates, differences in subjects' reading ability could bias the results when using this instrument (Murphy, 1994).

While meeting several of the criteria for the ideal instrument, these four personality tests also fall short in several areas. Verbal response measures are difficult to employ in advertising research. First, when adjective checklists or semantic differential scales are used in assessment, the precise meaning of the words may vary from person to person. Second, tests that require comparisons also demand higher cognitive involvement and respondents may not always be willing or able to respond precisely in these situations. Third, each of these tests requires a considerable time commitment on the part of both the respondent and the researcher.

Fortunately, a nonverbal instrument that can be rapidly administered is available, and while the tool has not been used for personality measurement it has been successfully correlated with the semantic differential scales used in emotional response measurement (Morris, Bradley, Sutherland, & Wei, 1993; Morris, Bradley, Lang, & Waine 1992;

Morris & Waine, 1993). SAM is a graphic character that eliminates much of the bias associated with verbal measures, and it is quick and simple to use (Morris et al 1992; Lang, 1980).

In fact, there is some support for the link between emotional response measurement and personality measurement. In a series of factor analytic studies Peabody (1967, 1970, 1978, 1984) uncovered a dimension of general evaluation plus two descriptive dimensions of personality—dimensions that Goldberg (1993a) finds similar to the E-P-A (evaluation, potency and activity) emotional components of Osgood, Suci and Tannenbaum (1957). In a 1989 study Peabody and Goldberg were able to incorporate the three Peabody factors into the Big-Five personality structure.

Development of a nonverbal, easy to administer personality measurement instrument, based on the Five Factor personality model, would allow marketers, researchers and advertisers to standardize on a tool that can provide a baseline of personality measures. Establishing these baseline data points would allow meaningful measurement of similarities and differences both within and between brands. It would allow for longitudinal studies of brand personality. Such an instrument could contribute to a better understanding of the consumers' perceptions of a brand's personality. Inferences about brand personality that transcend products and markets have tremendous strategic implication for marketing, advertising and product development.

CHAPTER 2
REVIEW OF LITERATURE

Meaning

> It is also somewhat startling to note that, even with college students of considerable sophistication and intelligence as subjects, almost half of the total variance in meaningful judgments of 20 varied concepts against 50 varied scales can be accounted for in terms of only these three factors, evaluation, potency, and activity. (Osgood et al., 1957, p. 38)

In any domain of science the availability of constructs relevant across a wide range of phenomena is vital if universal theories are to be established. A common framework of measurement allows the integration of seemingly unrelated events so that findings in one area may be interpreted in light of the discoveries in other areas. Applying this concept to the study of brands-products-advertising-consumers requires the discovery of dimensions relevant in many situations, capable of explaining a variety of human behavior. These dimensions must exhibit variability across situations and distinguish intra- and interpersonal reactions to others, objects, and situations. This lack of agreed upon framework has been problematic for researchers of emotional response who have variously investigated "emotion" (Holbrook & Batra, 1987; Rossiter & Percy, 1991), "affect" (Batra & Holbrook, 1990; Batra & Ray 1986), "warmth" (Aaker et al., 1986), "feelings" (Aaker, Stayman, & Vezina, 1988; Burke & Edell, 1989; Edell & Burke, 1987), "mood" (Gardner, 1985; Hill, 1988), "attitudes" (Burke & Edell, 1989; Edell & Burke, 1987; Holbrook & Batra, 1987; Stayman & Aaker, 1988), and "motivation" (Rossiter & Percy, 1991).

A similar situation has plagued personality researchers. Various personality traits including "intelligence" (Spearman, 1904), "moral characteristics" and "will" (Webb, 1915), "cleverness" (Garnett, 1919), "surgency and maturity" (Cattell, 1933), "depression, rhathymia, liking for thinking, and shyness" (Guilford, 1939), "reflective, impulsive, sociable, active, dominant, vigorous and emotionally stable"(Thurstone, 1947), "extroversion, neuroticism and psychoticism" (Eysenck, 1955), "neuroticism, extraversion, openness, agreeableness and conscientiousness" (Goldberg , 1983; Costa & McCrae, 1985) have been used to describe aspects of personality.

If not the first to measure the basic dimensions of emotion and personality, Osgood, Suci and Tannenbaum are undoubtedly the most cited researchers on the subject (Aaker, 1997; Bradley & Lang, 1994; Goldberg, 1993a; Mehrabian, 1995). Within the general framework of learning theory, they identified a process of encoding and decoding meaning mediated by overt behaviors, both linguistic and nonlinguistic. In decoding, stimuli (signs including language) activate a process of representation generation (meaning). In encoding, responses (signs including language as responses) are selectively generated as the result of the representation (meaning) processes (Osgood et al., 1957 p. 6). Many linguists (Bloch and Trager, 1942; Joos, 1950; Harris, 1951) incorporate the study of meaning in grammatical structure analysis. Meaning is defined as the function or position of the grammatical structure in language. Ogden and Richards (1923) define meaning as the relationship between objects (significates) and signs (symbols), and the relationships between signs and assigns (symbols describing the relationships among signs). Meaning is not the object but that which gives rise to the idea, thought or expectation of the object. Morris (1946) defined meaning as the disposition to make any of the responses associated with the object when presented with a sign for that object. In Pavlov's (1927) famous experiment, the sound of a tuning fork was the conditioned stimulus or sign. This sign produced a salivation response (meaning) in the dog even in the absence of the food object. Razran also used this approach (1939). He showed that a response could be conditioned to a word or sentence and then generalized to other words or sentences in a process he called semantic generalization. Bingham (1943) showed a physiological component in meaning. Subjects rated words in terms of meaningfulness, significance and importance. He then correlated Galvanic skin response to an index of these ratings. Results suggested the physiological gauge and the verbal index both measured meaning.

This process of meaning evaluation can be accounted for using three factors–evaluation, potency, and activity. These three factors are not always equally important or used equally in evaluation, but the factors are always present when subjects are asked to differentiate among items. In this "meaning space," the valence of one dimension does not influence the valence or connotation of another dimension. For example "hero" may be judged "good" and "strong" while a "pacifist" is judged "good" and "weak." The space is stable with respect to the three factors and the factors emerge in roughly the same order of magnitude. Evaluation or "good bad" is the first factor followed by potency or what might be described as a dimension of power and the things associated with it, size, weight, toughness, etc. The third dimension, usually about equal to or a little smaller in magnitude than the second factor, is the activity dimension—concerned with quickness, excitement, warmth or agitation. But the space is modifiable. The nature and order of the dimensions can change depending on the relative importance of each dimension in the evaluation (Osgood et al., 1957).

Are the "meaning states" described by Osgood, Suci and Tannenbaum emotional states? "Perhaps we should admit that the word 'meaning' is used in several senses; whether or not it is meaning that we are measuring, then, would seem to be merely a matter of choice of terms" (Osgood et al., 1957 p. 325). In fact, Osgood (1960) does call these dimensions the "connotative or affective 'feeling tones' of meaning"(p. 167).

Emotion

Research using the semantic differential and numerous diverse stimuli (Osgood, 1966; Osgood, Suci, & Tannenbaum, 1957; Snider & Osgood, 1969) has categorized human judgment and reaction to a wide range of stimuli. These studies defined arousal (the activity factor) and pleasure (the evaluation factor) as basic responses to stimuli, and also suggested a third dimension, dominance or potency.

Mehrabian (1995) also sees these semantic differential factors of evaluation, activity, and potency as the lowest common denominators of cognitive response to physical and social surroundings. These cognitive assessments, in turn, have definite emotional counterparts. More positively evaluated entities elicit greater feelings of pleasure than displeasure, more active entities elicit greater arousal than nonarousal, and more potent entities elicit greater submissiveness than dominance. In short, these three dimensions of the semantic differential highlight an even more rudimentary aspect of human functioning–emotional states–which not only constitute the base for elementary cognitive judgments in all situations, but have direct bearing on many other facets of intra- and interindividual functioning (Mehrabian, 1995).

Initial work with the semantic differential was aimed at denoting a limited set of factors that could be used to describe the meaning of concepts. However, other research has greatly extended the scale's applicability. Artists and nonartists judged various kinds of paintings and rated them on semantic differential scales (Tucker 1955). Solomon's (1954) study of the judgments of sonar signals again yielded the same three factors. In a study of emotional reactions, a similar set of three basic dimensions was obtained by Bush (1973). Bush selected 264 adjectives to sample the entire domain of feeling responses and scaled these with a multidimensional scaling technique. Three dimensions resulted from the analysis and corresponded to the three factors of the semantic differential. These dimensions were named pleasantness-unpleasantness, level of activation, and level of aggression. Even though Bush (1973) named the third factor "aggression," he noted that,

> Perhaps the only clear parallel between dimension three and dimensions in other studies is to potency of the semantic differential. The difference between words high and low on the dimension seems to be arousal for defense and autonomy, e.g., outraged versus needed, which is interpersonal potency by most definitions. (p. 55)

Several authors (Aaker et al., 1988; Batra & Holbrook, 1990; Holbrook & O'Shaughnessy, 1984; Rossiter & Percy, 1991) suggest that a limited set of basic emotional responses exists for all stimulus situations. These responses are independent of the senses involved. Responses of evaluation correspond to pleasure. Responses involving a level of activity on the semantic differential correspond to the emotional response of arousal. The judgmental response of potency corresponds to an emotional reaction labeled dominance versus submissiveness (Holbrook & O'Shaughnessy, 1984). These three dimensions—pleasure, arousal, and dominance—constitute the common core of human emotional responses to all situations (Mehrabian, 1995).

Additional terms for describing a diversity of emotional reactions to situations may be defined in terms of these three basic dimensions. Thus, for example, the feeling of fatigue is described as an emotion that is low on pleasure, arousal, and dominance. On the other hand, excitement is characterized as an emotional state of high pleasure, arousal, and dominance. Anxiety and stress rate high on arousal but low on pleasure and dominance. Relaxation, contentment, and comfort rate high on pleasure and dominance but low on arousal. Anger and hostility rate high on arousal and dominance but low on pleasure (Mehrabian, 1977, 1978, 1980).

The Emotional Dimensions

Pleasure-displeasure is a feeling state that can be assessed readily with semantic differential measures or with behavioral indicators such as smiles, laughter, and, in general, positive versus negative facial expressions. Facial expressions have an advantage of being reliably scored on a dimension of pleasantness which is independent of both their aroused and dominant-submissive quality, and thus provide an important behavioral index (Mehrabian & Epstein, 1972).

The dimension of arousal-nonarousal refers to a combination of activity and alertness. A very high state of arousal is one in which the individual is both active and alert (e.g., a athlete who is moving across the playing field (activity) while planning a strategy and trying to anticipate his opponent's moves (alertness)). A moderately high state of arousal may involve very high alertness but little activity (e.g., someone solving a very complex mathematical problem) or high activity and low alertness (e.g., a jogger who is daydreaming). A very low state of arousal involves low alertness and low activity (e.g., someone who is comfortably asleep). The level of arousal may be defined as a composite of its alertness and activity (Mehrabian, 1977, 1995).

Dominance-submissiveness in a situation is based on the extent to which a person feels unrestricted or free to act in a variety of ways. This feeling can be hampered by settings that limit the forms of behavior and enhanced by settings that facilitate a variety of behaviors. For instance, individuals have greater freedom, and therefore a feeling of dominance, in their own territory (e.g., listening to music at home relative to doing so in a concert hall or reading a book at home rather than in a library). Physical stimuli rated as more intense and more powerful on the semantic differential are associated with a submissive feeling for the person encountering them. Also, some social situations, such as religious ceremonies, that constrain behavior are typically associated with less freedom of choice and less dominance (Mehrabian, 1977, 1995; Mehrabian & Hines, 1978).

The dominance dimension differs from pleasure and arousal in another important way. Results of a number of proprietary research projects (Morris; Morris & Geason; Morris & Sutherland) indicate that unlike pleasure and arousal, the valence of dominance is dependent upon the vantage point of the observer. That is, an object that is perceived to be in a highly aroused state may also induce a highly aroused state in the observer. Likewise, an object that is in a highly pleasurable state may induce a state of high pleasure in the observer. However, an object perceived to be in a state of high dominance will induce a state of low dominance (submissiveness) in the observer. When presented with a puppy as a stimulus, the observer is likely to report high dominance and imbue the puppy with submissiveness. In confronting a large man with a gun, the respondent is likely to report a personal feeling of submissiveness while attributing high dominance to the large man with the gun. This situation also arises in the respondent's relationship to objects (significates) and signs (symbols). A picture of a snake (sign) may evoke a quite different dominance response than the presence of a live snake (object, significate).

Russell and Mehrabian (1977) propose these factors as the three basic dimensions of all emotion and the only ones needed to define the full range of feeling. Pleasure accounts for the most variance, followed by arousal and then dominance. However, the third dimension is still of considerable importance. Only dominance makes it possible to distinguish angry from anxious alert from surprised, relaxed from protected, and disdainful from impotent. And, all eight possible combinations of high and low values along each of the three dimensions actually occur as components of various emotional states. Dominance is inadequately explained as a combination of pleasure and arousal. At the same time other potential dimensions such as anger and anxiety can be defined as combinations of pleasure arousal and dominance (Russell & Mehrabian, 1977).

Meaning and Personality

As early as 1904 researchers were using ratings and groupings of characteristics in attempts to discover the basic components of personality (Spearman, 1904; Webb, 1915; Garnett, 1919). By 1954 Osgood Suci and Tannenbaum and their colleagues were applying the semantic differential scale to the studies of personality. The philosophy was that the semantic differential could be employed in any hypothesis-testing situation in personality research where some aspect of meaning was functioning as either the dependent or the independent variable (Osgood et al., 1957). Personality could be measured and represented in several different ways using this technique. One method simply plotted the location of "me," or "I normally feel" in three-dimensional space. Another technique measured the distance between "me" and a variety of personality trait adjectives or other descriptors. Third, an index of self-concept based on indicators of "actual self," "ideal self," and "least liked self" could be constructed (Osgood et al., 1957).

As noted above, several researchers had theorized various dimensions of personality (Spearman, 1904; Webb, 1915; Garnett, 1919; Cattell, 1933; Guilford, 1939; Thurstone, 1947; Eysenck, 1955). However, the work of Peabody is noted in particular here because Goldberg has acknowledged the work as having a "profound impact on my thinking" (Goldberg, 1993a). In a series of factor analytic studies of personality traits, Peabody (1967, 1970, 1978, 1984) uncovered a dimension of general evaluation plus two descriptive dimensions. Dimension one, or an evaluation dimension, was anchored with terms such as inhibited versus uninhibited and stingy versus generous. The second dimension, called assertiveness, was marked with traits such as bold versus timid and domineering versus submissive. The third dimension, impulse control with the "tight-loose" traits of inflexible versus flexible and firm versus lenient. This early model, while ultimately discarded in favor of the five-factor model is important as a link between studies of emotion and personality. Osgood, Suci and Tannenbaum earlier identified Peabody's dimension of evaluation. Peabody's other two dimensions share important similarities with the dimensions labeled potency and activity by Osgood Suci and Tannenbaum (1957).

The link with personality models is further strengthened in a 1989 study conducted by Peabody and Goldberg. They were able to show that the three Peabody dimensions are actually variants of the Big-Five factor model. The three largest factors of the Big-Five model, traditionally called Surgency (Factor I), Agreeableness (Factor II), and Conscientiousness (Factor III), can be transformed into the three Peabody factors. As one would expect, if the variables associated with Surgency, Agreeableness and Conscientiousness are plotted in a three dimensional space defined by these same three descriptors, the points are evenly distributed in that space. If however these same variables are rotated to a factor of "general evaluation" the Peabody dimensions emerge (Peabody & Goldberg, 1989).

Emotion and Personality

From a measurement standpoint, emotional traits (or temperament) can be inferred by measuring and averaging an individual's emotional states across a wide and representative sample of everyday situations (Mehrabian, 1978). The three dimensions of pleasure, arousal and dominance suggest that emotions constitute the basic elements of nonverbal and implicit verbal messages. The implications of these findings for personality description are evident. A small number of personality dimensions that are stable across a large variety of physical and social situations and capable of identifying individual differences would be useful in a number of disciplines.

The state versus trait distinction is useful for characterizing differences between emotional reactions (state) and emotional predispositions (trait). "Emotional states" refer to transitory conditions of the organism, conditions that can vary substantially, and even rapidly, over the course of a day (feeling alert versus tired or happy versus sad). In contrast, "emotional traits" are stable over periods of years or even a lifetime.

Mehrabian uses the three emotional response dimensions to identify characteristic or habitual response tendencies. This makes possible a comprehensive description of individual differences in terms of habitual or characteristic emotional reactions to varied stimuli. In a series of studies (Mehrabian, 1978), three orthogonal measures of temperament, trait pleasure, trait arousal, and trait dominance were developed for the description of temperament.

Trait pleasure correlates directly with social desirability, achieving tendency, extroversion, and affiliative tendency, and it correlates inversely with measures of trait anxiety, neuroticism, and aggression. Trait arousal does not relate to social desirability and is a direct correlate of trait anxiety, neuroticism, and aggression. Trait dominance is also free of social desirability bias and exhibits direct correlations with measures of dominance-submissiveness, autonomy, extroversion, achieving tendency, and aggression, and inverse correlations with measures of trait anxiety and neuroticism (Mehrabian, 1978).

Trait Pleasure, Trait Arousability, and Trait Dominance define three nearly independent axes of a temperament space. Points in this space define individuals. Segments or regions of the space define personality types. Straight lines drawn through the intersection point of the three axes define various personality dimensions. If each of the dimensions is dichotomized, personality types can be assigned as follows: Exuberant (+P+A+D) vs. Bored (-P -A -D); Dependent (+P+A-D) vs. Disdainful (-P -A +D); Relaxed (+P-A+D) vs. Anxious (-P +A -D); Docile (+P-A-D) vs. Hostile (-P +A +D). In the pleasure arousal dominance temperament model, trait pleasure-displeasure also serves as a general index of psychological adjustment-maladjustment. Individuals with pleasant temperaments are categorized as psychologically adjusted, whereas those with unpleasant temperaments are considered maladjusted. Thus, exuberant, dependent, relaxed, and docile temperament types illustrate four distinct categories of psychological adjustment, whereas bored, disdainful, anxious, and hostile types exemplify four categories of psychological maladjustment. Mehrabian also developed regression formulas for using temperament scores to compute and predict a variety of personality scores (Mehrabian 1996).

Describing these personality types we see first an exuberant depressed dimension, which is anchored by the attributes of pleasant, arousable, dominant versus unpleasant, unarousable, and submissive. Second is a relaxed-anxious dimension ranging from pleasant, unarousable, dominant to unpleasant, arousable and submissive. Third, a disdainful-dependent component ranging from unpleasant, unarousable, dominant to pleasant, arousable, submissive. And, fourth is a hostile-docile element running from unpleasant, arousable, dominant at one end of the continuum to pleasant, unarousable, submissive at the other end.

The Exuberant-Depressed Diagonal

The exuberance pole is broadly represented by many subtle variations of a pleasant, arousable, and dominant temperament. Extreme low scores on the Mehrabian's scales in the "exuberant" group would be suggestive of a tendency toward depression.

The Relaxed-Anxious Diagonal

This diagonal includes traits representing a relaxed (pleasant, unarousable, dominant) temperament. And is contrasted at the opposite end of the scale with traits characterizing an anxious (unpleasant, arousable, submissive) temperament. Using this terminology, a relaxed temperament is the most direct opposite to an anxious one and is most likely associated with a sense of well-being and psychological health.

The Disdainful-Dependent Diagonal

This dimension is defined by aspects of a disdainful (unpleasant, unarousable, dominant) temperament versus a dependent (pleasant, arousable, submissive) temperament. The distinction between a "disdainful" and a "hostile" temperament is important here. Disdainful and hostile temperaments both involve displeasure and dominance but are distinguished in terms of arousability. Hostile persons are arousable, disdainful ones are unarousable. Thus, for example, the antisocial behavior associated with a disdainful temperament is more likely to be "cold and calculating," involving elaborate planning and careful consideration of risks, whereas antisocial behavior associated with hostility might involve a greater degree of physical violence and subjectively uncontrollable aggressive or destructive behavior.

The Hostile-Docile Diagonal

The hostile (unpleasant, arousable, dominant) temperament type is distinguished here from its opposite pole, the docile (pleasant, unarousable, submissive) temperament. Emotion terms that correspond to the combination of pleasant, unaroused, and submissive feelings are helpful for describing the docile pole of this measure. Consoled, sleepy, tranquilized, sheltered, protected all relate to the docile personality type. Thus, docility and dependency both involve pleasant and submissive attributes, but dependent persons are arousable, whereas docile ones are unarousable.

The Five-Factor Model of Personality

Several early authors (McDougall, 1932; Thurstone, 1934; Fiske, 1949; Tupes and Christal, 1958) discuss five factors as being sufficient to describe the dimensions of personality. However, the 1961 work of Tupes and Christal (1961a, 1992) is important to the development of the five-factor model in that it summarized and reaffirmed the results of earlier research (McCrae, 1992). In the article, Tupes and Christal report the results of four original studies as well as the results from the reanalysis of data from four other studies; two studies by Cattell, and two sets of data from Fiske's (1949) study. Tupes and Christal found five factors that were stable across replications. They also found these factors in their reanalysis of Cattell (1947) and Fiske (1949). In essence, Tupes and Christal conducted a meta-analysis, relating their own results to results obtained by analyzing the correlations of other investigators and comparing the factors across studies. This study, and a second study by Tupes and Kaplan (1961), demonstrated the robustness of the five-factor solution.

Until recently the psychometric approach to the essential dimensionality of personality constructs had failed to produce a generally accepted model. Cattell (1947) believed the structure was very complex, with a minimum of 16 essential personality factors, while Peabody (1967, 1970) and Costa and McCrae (1976) offered structures that were quite simple, models with only three factors. Personality psychology rediscovered the five-factor model in the 1980s. After attending a meeting of the Western Psychological Association, Goldberg (1983) continued a discussion of a five-factor personality construct at a seminar organized by Paul Costa at the Gerontology Research Center in Baltimore. Costa and McCrae, added Agreeableness and Conscientiousness to their three-factor view of personality (Neuroticism, Extraversion and Openness) (Costa & McCrae, 1976). The first personality assessments based on the five-factor model were published in 1985 (Costa & McCrae, 1985). Within a few years, Costa and McCrae (Costa 1991; Costa & McCrae, 1985, 1988a, 1988b, 1992a, 1992b; Costa et al., 1991; McCrae 1992; McCrae & Costa , 1985a; McCrae & John, 1992) produced studies that offered evidence of the presence of some or all of the five-factors in many well-known inventories including the Personality Research Form (Jackson, 1984), the California Q-Set (Block 1961), and the Myers-Briggs Type Indicator (Myers & McCauley, 1985).

A Framework for Describing Personality: The Lexical Hypothesis

Personality attributes are encoded in the natural language. This proposition is the first part of the lexical hypothesis (Saucier & Goldberg, 1996). Any personality attributes worth noticing become encoded in language as words and the words are maintained in language by frequent use. In this respect, language comes to reflect our knowledge of the world, and indeed, language is the prime medium through which we come to "know" personality (Saucier & Goldberg, 1996). Any aspect of human personality that is important, interesting or useful has been recorded in language (Cattell, 1943). As Cattell (1957) argued, "Over the centuries, by the pressure of urgent necessity, every aspect of one human being's behavior that is likely to affect another has come to be handled by some verbal symbol, at least in any developed modern language." While this language of personality provides a framework for description it does not but not necessarily provide an explanation (John & Robins, 1994). We can describe an automobile as it travels down the road but we may not know "what makes it go." Put another way, the language of personality refers to phenotypes (what is observable on the surface) and not genotypes. The concept of genotype refers to underlying (causal) properties, or the attributes determined by our genetic makeup. The concept of phenotype refers to observable (surface) characteristics (Saucier & Goldberg, 1996). The visible attributes of personality may be the expression of genetic inheritance (for example an attribute like "quick learner" could be related to IQ), or the result of experience, conditioning, social learning, culture or any combination of these (for example the attribute of shyness or aggression might be related to conditions in the home environment). This might also be viewed as the difference between "nature" and "nurture" and leads to data that needs explaining, but not necessarily to the explanation. Thus, the lexical basis of personality description makes no explicit assumptions (or claims) about traits, the origin of traits or the stability of traits (Saucier & Goldberg, 1996). Trait theory, the contrary view of Costa and McCrae (1991) assumes personality characteristics are relatively stable over time and across situations.

The degree of representation, that is the number of synonyms for an attribute in a language corresponds to the general importance of the attribute. This proposition is the second part of the lexical hypothesis (Saucier & Goldberg, 1996). This idea was first proposed by Zipf (1949). Saussure (1983) suggested that important attributes would be discernable as a "constellation" of roughly synonymous terms (an idea that brings to mind the idea of emotional or personality space). This part of the lexical hypothesis can be formulated as either an inter- or intralanguage concept. As an interlanguage concept, "The more important an individual difference in human transactions, the more languages will have a term for it" (Goldberg, 1981, p. 142). The intralanguage concept implies that more important attributes will have more synonyms and more subtly distinctive facets within the language. Thus, the most important personality attributes should have a corresponding term in virtually every language (Saucier & Goldberg, 1996). And, important attributes will be referenced by a cluster of loosely synonymous terms have a "family-resemblance" (Rosch & Mervis, 1975).

This second lexical proposition implies that the significance of one isolated personality adjective is limited, and the extension of the lexical approach to identifying narrow facets of large factors violates the key premise of the approach. Aggregates of words are more significant than isolated words, and familiar and frequently used words are more significant than unfamiliar and infrequently used words (Miller & Johnson-Laird 1976).

There are a finite number of single terms that refer to personality in any language (For the English language, Allport and Odbert (1936) started with the 1925 edition of *Webster's New International Dictionary* and found 4,504 terms. Norman (1967) reduced this list to 2,800 trait describing terms). This makes possible random sample selection from a population of personality descriptors. This argument is important when considering the content validity of personality measures. The population of variables defined by the lexical perspective has the advantage of being little affected by short-term fads and fashions (Saucier & Goldberg, 1996). Although faddish terms constantly appear and disappear, the overall framework of language is comparatively conservative and slow changing. With the relatively unbiased selection of variables, an investigator minimizes prejudicing results—the all-important step of variable selection can be taken out of the investigator's hands and delegated instead to dictionaries or raters. However, in specifying a population of lexical variables, there are still difficult issues. First, not all person-descriptive terms would satisfy everyone's criteria for being "personality" relevant (Block, 1995; Peabody, 1987). Someone might take exception to physical descriptors (tall), appearance descriptors (good-looking), evaluative terms (excellent), and descriptors of social roles (professional), social effects (popular), or temporary states (embarrassed) (Chaplin et al., 1988). Second, the English language contains many terms whose use in person-description is ambiguous or metaphorical (foxy) and many terms that are obscure and difficult. Third, person-description employs different parts of speech. While English has a very large adjective class, the adjective function is sometimes carried out through nouns (he's a maverick) and verbs (working woman) (Saucier & Goldberg, 1996).

The structure of person-descriptions in phrases and sentences is closely related to descriptions based on single words. In fact, the syntax of personality-questionnaire items is typically not complex. For example, on the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992b), dozens of items are simply person-descriptive adjectives preceded by such phrases as "I am," or "I am not." Research on language suggests that single terms often function as phrases. For example, adults can typically infer full-sentence meanings from the speech of young children, (I'm sure all parents grasp the full sentence meaning of a young child announcing "potty" in the middle of a crowded shopping mall.) Also the instructions for most tests using a semantic format prime subjects to generate implied sentences, "Strong" meaning "I am strong" (Gough, 1983; Murphy, 1994; Myers & McCauley, 1985). The language of personality can be thought of as a semantic hierarchy consisting of words and phrases at different levels of abstraction. At the highest level is pure evaluation (good vs. bad). Still quite abstract, but lower in the hierarchy, are all of the single personality descriptors, which in turn can be ordered by their breadth. Each of these single terms (e.g., extraverted) can be specified, or contextualized in many ways, ("likes to tell jokes at parties"). These contextualizations form the basic building blocks of personality inventories. When viewed in this way it is possible to see why analysis of diverse personality scales generate the same factor structure as higher level single terms.

The most important dimensions in aggregated personality judgments are the most invariant and the most universal dimensions (Costa 1991; Costa & McCrae, 1985, 1988a, 1988b, 1992a, 1992b; Costa et al., 1991; Goldberg, 1993b; McCrae 1992; McCrae & Costa, 1985a; McCrae & John, 1992). Here, the lexical perspective is in line with the scientific goals of comprehensiveness, parsimony, and predictable replication. If a personality factor is found in only certain restrictive situations, that attribute would appear less basic than those that replicate across samples and targets. It follows then that the best solutions are also those that influenced least by the factor procedure used (John et al., 1991; Goldberg 1990, 1991).

The hypothesis of universal lexical dimensions includes two separate assumptions. The first concerns the broad dimensionality of the personality attribute space. The second concerns the exact locations of the factor axes within that space. To the extent most person descriptors are a blend of two or more different personality components, the analyses of different languages yields factors in different locations (Bond, 1979; Hofstee, 1997; Somer, 1999). Describing a person as extraverted will have different meanings for a German, an Italian and an American. In the same way that the Eskimos have "a hundred words to describe snow," unique cultural emphasis on specific personality attributes leads to more exact and more discerning definitions. These differences in the frequencies of terms for particular attributes lead to different factor locations (Hofstee, 1997).

A Framework for Describing Personality: The Trait Hypothesis

McCrae and Costa (1996) have noted that the Costa-McCrae FFM (Five Factor Model) is based on trait theory. That is, despite differences in culture, religion or environment the basic dimensions of personality are common across the human race and have some biological basis. While traits like "liberal" may seem far removed from a biological source, the broader dimension of "Openness to Experience" can be traced back to the exploratory behavior observed in animals (McCrae, 1996). This biological basis is supported by personality studies of twins separated and raised by different families. In these studies, genetic influences account for as much as half the variance in measured personality traits (Jang 1997; Loehlin, 1992). While stopping short of saying traits determine behavior independently of the situation, this theory does assert that traits have a prominent role in the explanation of behavior (McCrae & Costa, 1996). Individuals can be characterized by a distinctive personality-trait profile that shapes their thoughts, feelings, and actions throughout their adult lives (McCrae & Costa, 1985a). Traits form an explicit part of self-concept, providing both a sense of uniqueness in comparison with others and a sense of coherence across time (McCrae & Costa, 1996).

Questionnaire Development in Personality Measurement

Using questionnaires for the measurement of personality carries with it the assumption that people generally understand themselves and those around them and act in ways that are consistent with their conscious beliefs and desires. Theories of personality differ in assumptions about human rationality. Both radical behaviorism and psychoanalysis are characterized by a rejection of this common sense view of human nature and by a rejection of self-reports as a source of data.

There is empirical as well as theoretical support for the premise of rationality in questionnaire responses. Rational scales have been found to perform as well as scales created by other methods (Hase & Goldberg, 1967). The NEO-PI began with rationally constructed sets of items. Later, factor analyses confirmed as well as refined these rational groupings. Subsequent research has shown that the resulting scales discriminate such defined groups as patients in psychotherapy and antisocial drug abusers from normal volunteers (McCrae & Costa, 1996). Evidence also points to the value and accuracy of self-reports and to the utility of straightforward, even transparent, measures (Goldberg, 1993a). Individuals are knowledgeable and intelligent observers of their own thoughts, feelings, and behaviors, and thus one excellent source of personality data (Goldberg, 1993a).

But self-reports are not the only source of valid personality data. Observer ratings of traits have the advantage of using the inferential capacities of human judges while sidestepping potential falsification or distortion in self-reports (McCrae 1982; Costa &

McCrae 1992b). Research has shown that observer ratings and self-reports both produce a similar structure of personality traits (McCrae, 1982). The fact that individuals know themselves and the people around them well enough to serve as sources of scientific data is testimony to the basic rationality of human nature (Norman & Goldberg, 1966).

Over the past decade, much research (Costa 1991; Costa & McCrae, 1985, 1988a, 1988b, 1992a, 1992b; Costa et al., 1991; McCrae 1992; McCrae & Costa, 1985b; McCrae & John, 1992) has pursued a systematic analysis of major personality questionnaires in terms of the Five Factor Model, as a body, they appear to support three conclusions. First, despite diverse theoretical origins, the Five Factor Model appears to capture the major dimensions of personality common to most personality scales. Second, each of the five factors has conceptual roots in the psychological literature. The literature provides a rich source of conceptualizations for specific facets of each of the five domains (Jackson, 1984; Gough & Heilbrun, 1983; Edwards, 1959; Borkenau & Ostendorf, 1989; Costa, McCrae, & Dye, 1991). Third, traits themselves may be viewed from a variety of theoretical perspectives. Studies suggest that traits are complex psychological structures, with cognitive, interpersonal, motivational, and stylistic aspects, some adaptive, some pathological.

While it is possible to extract the Big-Five Factors using almost any collection of personality descriptors, the model is most efficient and parsimonious under more narrow definitions of personality. And, in fact, there is still a lack of consensus in what is included as "personality" and what is not. Some recent studies have excluded most terms referring to talents and capacities, while other researchers have explicitly included terms relating to intellect. Goldberg (1992) not only included terms relating to intelligence and other talents, but also included some terms excluded as "attitudes and world views" or as "temporary states" by the others. Given that these broadly different studies found a reasonably convergent five-factor structure, it might be concluded that such differences have relatively few consequences for factor structures. However, the possibility remains that the inclusion of a large number of terms relating to attitudes and world-views, or terms denoting physical characteristics, could result in more than a five factor solution. And, the inclusion of a large number of evaluation terms could affect the positions of the rotated factors. Some evaluation terms (e.g., cruel wicked) are markers of the negative pole of Big-Five Factor II (Agreeableness) (Saucier & Goldberg, 1996).

Positive evaluation terms also shift factor according to the type of target. For example, the terms excellent and impressive in self-ratings could signify narcissism, self-esteem, or personal accomplishment. In ratings of other people, these terms are more likely to signify likeability and prosocial attributes (Wiggins and Trapnell, 1996). As long as personality testing is conducted using both self and peer evaluation, many evaluative terms will be ambiguous (McCrae 1982).

The Big Five provides an organizing structure for most personality attributes, but it is not comprehensive. There are probably dimensions beyond the Big Five. Goldberg has reported small outlier dimensions, such as Religiousness, Culture, Prejudice, and Sensuality. These additional dimensions have far fewer adjectives defining them, and thus the lexical hypothesis would suggest that they are less important (Saucier & Goldberg, 1998). Because the Big Five model is based on the lexical hypothesis, it provides a rationale for assigning differential importance to one factor or another based on its salience in the natural language. Even though all of the five factors appear to be robust by general standards, evidence suggests that the first three factors (Extraversion, Agreeableness, and Conscientiousness) are typically more easily replicable than the latter two (Emotional Stability and Intellect or Imagination) (Saucier, 1995). Again, looking at the lexical basis for these findings, there are more English adjectives associated with each of the first three factors than with either of the latter two (Goldberg, 1990).

It is important to understand that the Big Five do not form tight and discrete clusters of variables; rather, each factor represents a major concentration in a continuous distribution of attributes in descriptive space. Just as humans can perceive a range of colors, and just as there is a continuous range of emotion, there is a range of personality. Saucier (1992) and Hofstee et al. (1992) have shown that most personality-attribute terms correlate with combinations of factors.

Personality Adjectives

> It is of considerable psychological interest to know that the whole list of sixty adjectives can be accounted for by postulating only five independent common factors. (Louis Thurston, 1934, p. 13)

For both emotional response measurement and personality measurement, the use of adjectives as descriptors is a wise choice for several reasons. First, the most distinctive, significant and widespread attributes (whether emotional states and traits or phenotypic personality descriptors) tend to become encoded as single words in language. Second, the number of terms representing the attribute increases as the importance of the attribute increases. Third, using adjectives as opposed to phrases provides a population of known size from which to draw a random sample for study. Phrases and sentences represent an infinite population that cannot be representatively sampled.

Lexical studies of English language personality descriptors date back to Allport and Odbert, who in 1936 used an unabridged dictionary and extracted 17,954 terms denoting aspects of personality. These were called "trait names." In 1967 Norman replicated this earlier work, using a new edition of the same dictionary he added 171 additional terms to the list. Norman produced a list of 2797 terms that he called "stable traits" and within this list he identified 608 "prime terms" chosen for low difficulty, colloquiality and awkwardness. In the late 1970s and early 1980s, Goldberg used a variety of criteria (including ambiguity, difficulty and slanginess) to reduce the pool to 492 trait terms. Saucier and Goldberg (1996) used 25 judges to eliminate the least familiar terms. These reviews resulted in a final list of 435 familiar adjectives. When used in self and peer ratings, these adjectives can be reduced by factor analysis to Big-Five personality factors—Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Intellect.

Mehrabian has conducted an analysis of the Big-Five factor personality factors in terms of his PAD temperament mode (1996). Five linear regression analyses were used to analyze each of the Big-Five factors as functions of trait pleasure, trait arousal and trait dominance. The PAD traits combined to form the Big-Five factors as follows: Extraversion is composed of positive pleasure, arousal and dominance. Agreeableness is composed of positive pleasure, and arousal with negative dominance. Conscientiousness is positive pleasure and dominance with no arousal component. Emotional stability is made up of positive pleasure and negative arousal with no dominance. Intellect (or what Mehrabian calls sophistication) is positive arousal and positive dominance. Sophistication lacks a pleasure component. Mehrabian also conducted a regression analysis and computed equations for the PAD temperament model in terms of the Big-Five factors. The PAD traits can be explained as follows: Trait pleasure is a combination of positive agreeableness, stability and extraversion. Trait arousal is negative stability with positive agreeableness and sophistication. Dominance is a mixture of positive extraversion, sophistication and conscientiousness with negative agreeableness.

Emotional Measurement Techniques

Techniques for measuring emotional response can be assigned to three broad categories; first, verbal techniques such as adjective checklists and semantic differential scales. With these methods respondents receive lists of words, statements, or word pairs and are asked to respond by choosing adjectives from the list, selecting from pairs or adjectives or rating statements along a semantic scale. These verbal measures are obviously limited to a population with some reading ability making the technique unsuitable for use among poorly educated or immigrant populations. The lists may not be comprehensive, and adjectives or statements may not have a common meaning across subjects. Second, physiological measures such at eye blink or Galvanic skin response. These methods are highly accurate and are not confounded by differing interpretation among respondents. However the measurements are difficult to interpret and apply to advertising and consumer behavior. Since these measurements must be collected under experimental/laboratory conditions the results cannot be generalized to the larger consumer population. Third, researchers often use nonverbal tools such as photodecks. However, because of the visual complexity and the rich amount of information contained in any photograph these methods are often biased. The great amount of information conveyed also makes it difficult to validate a common meaning across subjects.

Brand Personality

David Ogilvy equated brand personality with brand image saying, "Image means personality" (Ogilvy, 1985). Joseph Plummer says that brand personality is one of the three components of a brand's image (Plummer, 1985). According to Batra, Myers and

Aaker (1996), brand personality, along with attributes and consequences are the components of brand image. A brand personality can be established by the brand's relationship with certain characters, types of end users, endorsers, symbols, and lifestyles (Batra et al., 1996). Marketing communication strategies and media mix can influence brand personality (Batra et al., 1996). Brand personality is that unique set of all brand elements, which determines how consumers perceive a brand (Upshaw, 1995).

Plummer differentiates brand image from brand personality saying that brand personality is an internal concept held by consumers while brand image is external to the consumer. Brand image, made from attributes including packaging, product, name and distribution, is the way the brand is presented to the world (Plummer, 1984/85). Brand personality is the collection of human characteristics with which the brand is endowed (Blackstone, 1995). A brand's personality implies associated feelings (Batra et al., 1996). From a marketing standpoint, the brand is a projected personality (Dougherty, 1996). Jennifer Aaker (1997) defines brand personality as "the set of human characteristics associated with the brand."

Brand personality associations create a composite image of a brand much like the images we have of human personality (Batra et al., 1996). Like people, brands can have "identifying characteristics" (Batra et al., 1996). And people can have "relationships" with brands (Batra et al., 1996). In much the same way human interaction is used to support personal value systems (we don't hang around with "bad" people), a brand's personality also creates an association with personal values (Batra et al., 1996). A brand's personality can make the brand more interesting and memorable, and can even facilitate the expression of the consumer's identity (Aaker et al., 1996).

Like human personality, the descriptors of brand personality extend beyond simple demographic characteristics. Just as people can be characterized on hundreds of personality traits (Goldberg, 1990) brands can be characterized as adventurous, gentle, undependable, composed and crude (Batra et al., 1996). Aaker (1997) developed a framework for brand personality that includes the dimensions of sincerity, excitement, competence, sophistication and ruggedness.

Importance of Brand Personality

Today, most "real" differences between products have disappeared. In many product categories, consumers perceive the products to be nearly identical (Batra et al., 1996). Marketer's can differentiate on product personality. This may lead to increased market share and less downward pressure on product price (Batra et al., 1996). In addition, while tangible product features may be easy to emulate, the personality of the product usually cannot be duplicated (Batra et al., 1996).

For consumers, brand personality helps to define and reinforce a sense of self (Batra et al., 1996). In part, people are defined by their possessions, the products they buy and use. (Batra et al., 1996). As part of this process consumers select products that have a brand personality that is congruent with their own self-concept (Batra et al., 1996).

Research into Brand Personality

Both quantitative and qualitative techniques are available for assessing brand personality. Among the quantitative techniques available, rating techniques are perhaps the easiest to use (Batra et al., 1996). Consumers rate the brand on various personality adjectives. Different brands can then be compared on the strength of their ratings on these adjectives (Batra et al., 1996). However, this method does have disadvantages.

The list of adjectives might not be complete (Goldberg, 1990; Batra et al., 1996). As is often the case in opinion research, consumers might be unwilling or unable to rate products on the list of personality adjectives. Respondents may feel the terms are irrelevant (Batra et al., 1996).

Qualitative research techniques offer the option of follow-up or "probing" questions to help researchers get at a "truer" opinion of brand personality. The use of projective techniques allows respondents to express "unconscious" or difficult to articulate perceptions of personality (Batra et al., 1996). Photo sorts, "shopping lists" free word association, sentence completion, scene interpretation, psychodrama and animism are all used to gain qualitative insight into personality associations (Batra et al., 1996).

However, these techniques also suffer from problems of interpretation. As subjects' responses become richer and more detailed, clear differences are more difficult to uncover. As Batra explains, free association tasks can yield huge numbers of associations. These associations must then be ranked (key associations) and evaluated for fit (fits the brand). Often coders then rate such free associations (Batra et al., 1996).

Measuring Brand Personality

The difficulty in developing measures of brand personality stems from the complexity of personality itself. While there has been a convergence on the Big Five Factors as the basic dimensions of personality, measuring personality along these constructs requires the use of lengthy check lists. This difficulty is compounded when measuring brand personality. Often researchers are interested in the personality dimensions of multiple brands necessitating the fatiguing time consuming task of completing questionnaires for each product being tested.

Using an already existing personality test to measure the personality of brands would be of benefit for many reasons. First, the personality tests in wide use today are firmly grounded in accepted theory. Second, a commercially available test would have a high degree of reliability and validity (some of the tests in wide use today trace their history back to the 1940s, with dozens of studies investigating their theoretical and practical soundness). Third, a personality test in broad use would have norms and scales allowing for the interpretation of test results across various segments of the population.

The ideal instrument would be (1) a projective test that could be administered to consumers in the general population; (2) able to assess the personality of a wide spectrum of brands; (3) the test would be quick and easy to administer; (4) the directions should be understandable by the "average" consumer; (5) the specific instrument should have a basis in accepted personality theory; (6) evidence of reliability and validity should be documented through replicable research; (7) this evidence should be available or referenced in the test manual; (8) the test should measure the normal dimensions of personality; and (9) it should provide a means for interpretation of test scores across the general population.

The section on personality tests in *Tests In Print* lists nearly 400 personality tests. The section includes "Tests that measure individuals way of thinking, behaving, and functioning within family and society. Included here are projective and apperception tests, needs inventories, anxiety/depression scales, tests assessing substance use/abuse (or propensity for abuse), risk taking behavior, general mental health, emotional intelligence, self-image self-concept self-esteem, empathy, suicidal ideation, schizophrenia, depression/hopelessness, abuse, coping skills/distress, eating disorders, grief, decision-making, racial attitudes; general motivation, attributions, perceptions; adjustment,

parenting styles, and marital issues/satisfaction" (Murphy et. al., 1994). Initial review of the titles revealed 22 tests having potential applicability in the study of brand personality. Evaluation of the tests based on the nine criteria discussed previously reduced this list to four titles.

The Adjective Check List

The ACL is of particular interest here because it was originally designed "for use by observers in describing others." The test is further described by the authors as being useful in the characterization of "a commercial product." The Adjective Check List was designed to measure the normal dimensions of personality (making it much more useful than a test designed to measure deviant personality types) and the method was normed on a sample of approximately 10,000 subjects.

There appear to be two limitations to using the test to assess brand personality. First, the sheer number of adjectives used in the administration of the test (300) could cause subjects to become confused and fatigued. The high number of responses also increases the difficulty of scoring the test. Second, it appears that the test would be biased against respondents with poor reading skills (Murphy, 1994).

The Myers-Briggs Type Indicator

The MBTI is a candidate for use in a study of brand personality because of the stated purpose of the test,

> To identify, from self-report of easily recognized reactions, the basic preferences of people in regard to perception and judgment, so that the effects of each preference, singly and in combination, can be established by research and put to practical use. (Myers & McCaulley, 1985, p. 1)

The test has been widely used and is generally accepted as an indicator of the personality characteristics of C. G. Jung.

One possible drawback to using this test as a tool in the investigation of brand personality is the length of time required for administration. The Burros Mental Measurement Tests reports the length of time necessary to complete the test as 30 to 40 minutes. In addition, this is a "self-report" tool. The validity of the MBTI as a projective test has not been established. However, with 50 years of study and use the test has the advantage of much supporting documentation, including a large bank of descriptive phrases associated with each of the personality types (Murphy, 1994).

The Guilford-Zimmerman Temperament Survey

First published in 1949, the GZTS is another test with an established record of use and critical evaluation. The GZTS has been used in over 500 studies and consequently much is known about the reliability and validity of the instrument. Supporting material for the test includes a booklet containing an interpretation system to assist in preparing reports based on GZTS scores.

However, the time necessary to administer the test appears to limit its usefulness in the study of brand personality. The Guilford-Zimmerman Temperament Survey is a 300-item inventory and requires approximately 45 minutes to administer. It is easy to imagine a situation where respondents become careless and uninterested during the administration of this test. The number of items would make tabulating the results of a wide scale administration cumbersome. Alternatively, the use of computer scoring forms or "bubble-sheets" could prove to be an obstacle for some respondents. As with the other tests discussed the GZTS is biased against persons with limited language ability (Murphy, 1994).

Revised NEO Personality Inventory (NEO-PI-R)

The test is based on the five-factor model of personality. This construct has been used in the study of personality for over 50 years. The NEO-PI-R assesses the domains of the five-factor model neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). The test provides scores for these five domains as well as six sub-scale facet scores for each domain. The NEO-PI-R is available in a self-report and an observer-report version as well as a short form of the test. A shorter version of the self-report instrument, (the NEO-FFI), has also been developed. Respondents can complete this assessment in 10 to 15 minutes. Separate NEO-PI-R questionnaires are also available for men and women. Norms are based on a sample of 1000 respondents. These subjects were selected from three large-scale studies of the NEO-PI-R and the sample was stratified to match 1995 US census projections for age, gender and ethnicity. Extensive documentation is available in the test manual. The manual contains information on both the long and short version of the test and a bibliography of research on the NEO inventory. The manual also contains information of the history, theory and application of the five-factor model of personality.

Scoring procedures include details for assessing a variety of response biases including random response, acquiescence and nay saying. There is also a three-item validity check for honesty and accuracy in the completion of the questionnaire. The validity of the instrument seems to have been well established by many authors including a series of studies on construct, convergent and divergent validity conducted by the authors of the test, Costa and McCrae.

Here again, the long form of the NEO-PI-R takes 30 to 40 minutes to administer and, as was the case for the other test candidates, differences in subjects' reading ability could bias the results when using this instrument (Murphy, 1994).

While meeting several of the criteria for the ideal instrument, these four personality tests also fall short in several areas. Verbal response measures are difficult to employ in advertising research. First, when adjective checklists or semantic differential scales are used in assessment, the precise meaning of the words may vary from person to person. Second, tests that require comparisons also demand higher cognitive involvement and respondents may not always be willing or able to respond precisely in these situations. Third, each of these tests requires a considerable time commitment on the part of both the respondent and the researcher.

Fortunately, a nonverbal instrument that can be rapidly administered is available, and while the tool has not been used for personality measurement it has been successfully correlated with the semantic differential scales used in emotional response measurement (Morris, Bradley, Sutherland, and Wei, 1992; Morris et al 1992; Lang, 1980). SAM is a graphic character that eliminates much of the bias associated with verbal measures, and it is quick and simple to use (Morris & Waine, 1993; Lang, 1980).

In fact, there is some support for the link between emotional response measurement and personality measurement. In a series of factor analytic studies Peabody (1967, 1970, 1978, 1984) uncovered a dimension of general evaluation plus two descriptive dimensions of personality—dimensions that Goldberg (1993a) finds similar to the E-P-A (evaluation, potency and activity) emotional components of Osgood, Suci and Tannenbaum (1957). In a 1989 study Peabody and Goldberg were able to incorporate the three Peabody factors into the Big-Five structure.

Development of a nonverbal, easy to administer personality measurement instrument, based on the Five Factor personality model would allow marketers, researchers and advertisers to standardize on a tool that can provide a baseline of personality measures. Establishing these baseline data points would allow meaningful measurement of similarities and differences both within and between brands. It would allow for longitudinal studies of brand personality. Such an instrument could contribute to a better understanding of the consumers' perceptions of a brand's personality. Inferences about brand personality that transcend products and markets have tremendous strategic implication for marketing, advertising and product development.

A Nonverbal Measure

As previously discussed, the Semantic Differential Scale devised by Mehrabian and Russell (1974) is a widely used instrument for measuring emotional response. Although this method is informative, there are a number of difficulties associated with it. First, it is cumbersome to measure 18 different ratings for each stimulus presented in an experimental session. There is a heavy investment of time and effort. This results in a relatively large database that requires rigorous statistical analysis for interpretation. Second, the reliance on a verbal rating system makes it difficult to utilize this methodology in non-English speaking cultures (unless there has been translation and validation) and in populations which are not linguistically sophisticated (children).

To address these issues, Lang (1980; Hodes, Cook, & Lang, 1985) devised a picture-oriented instrument called the Self-Assessment Manikin (SAM) to directly assess the pleasure, arousal, and dominance. SAM was originally implemented as an interactive computer program, and later was expanded to include a paper-and-pencil version for use in groups and mass screenings. SAM ranges from a smiling, happy figure to a frowning, unhappy figure when representing the pleasure dimension, and ranges from an excited, wide-eyed figure to a relaxed, sleepy figure for the arousal dimension. The dominance dimension represents changes in control with changes in the size of SAM. A large figure indicates maximum control in the situation.

SAM has been used effectively to measure emotional responses in a variety of situations, including reactions to pictures (Greenwald, Cook. & Lang, 1989; Lang, Greenwald, Bradley, & Hamm, 1993), sounds (Bradley, 1994), and advertisements (Morris, Bradley, Waine, & Lang, 1992). In addition, SAM has been used with children (Greenbaum, Turner, Cook, & Melamed, 1990) and adults in different life stages (Cuthbert, Bradley, & Lang, 1988). In clinical settings SAM has been used with anxiety patients (Cook, Melamed, Cuthbert, McNeil, & Lang, 1988), analogue phobics (Hamm, Globisch, Cuthbert, & Vaiti, 1991), and other clinical populations.

Affective reports of the amount of pleasure, arousal, and dominance experienced while processing emotional stimuli can be directly assessed using SAM, a nonverbal, graphic representation of the three fundamental emotional dimensions. Near perfect agreement has been obtained in ratings of pleasure and arousal for a set of pictures using the semantic differential scale and SAM (Bradley & Lang, 1994).

Differences obtained in judgments of dominance suggest that SAM might be more accurate in tracking the subject's—rather than the stimulus'—feelings of control. SAM allows rapid assessment of what appear to be fundamental dimensions in the organization of human emotional experience, as well as an assessment of the shape of the resulting affective space. Covariation between reports of pleasure and arousal using SAM and responses in physiological and behavioral systems has already demonstrated strong concordance. SAM has been shown to be an effective method for measuring existing feeling states, relating them to other indices of emotional response, and assessing changes due to time, therapeutic intervention, or other processes affecting affective reactions to contextual stimuli.

CHAPTER 3
METHODOLOGY

Introduction

Can a nonverbal measurement tool quickly and accurately assess the Big Five personality dimensions theorized by Goldberg (1990)? To investigate this possibility, Goldberg's (1992) 50-item scale was used to measure the Big Five personality dimensions. The three scales of the SAM emotional response measurement tool (Lang, 1980) were used to measure the dimensions visually. These scales have been shown to be highly correlated with Mehrabian's semantic differential scale (Morris, Bradley, Waine & Lang 1992) and Mehrabian has demonstrated the relationship between PAD and the Big Five factors (Mehrabian 1996). The relationship between SAM and Mehrabian's personality scales has also been established (Parker, 1999).

Subjects

A pilot study was conducted using 100 subjects chosen randomly from a panel maintained by National Family Opinion (NFO). Participants for the general study were also selected at random from this panel.

Factor Analysis Sample

As a general rule, the minimum sample size for a factor analysis is five times the number of variables used in the factor analysis (Hair et al., 1998). More acceptable sample sizes are in the range of 10-to-1. Some researchers propose a 20-to-1 ratio (Hair et al., 1998).

Structural Equation Model Sample Size

Even though individual responses were not used as data in the procedure, sample size was an important consideration because it played a critical role in estimating sampling error. For structural equation modeling, sample size should be based on (1) model misspecification or specification error (2) model size, (3) normality of the data, and (4) estimation procedure (Hair et al., 1998). If specification error is not believed to be an issue, the model is not large and complex, and the data represent a normal distribution, sample sizes of 200 are adequate (Hair et al., 1998). In this case, a much smaller sample than was needed for the factor analysis.

Procedure

Building on the work of Parker (1999) and input from researchers at NFOR, five brands were used in this analysis: Hallmark Cards, MTV, The Wall Street Journal, Gerber Baby Foods and Mercedes Benz. In addition, support for the selection of these brands was based on recommendations outlined by Aaker (1997). Aaker has listed three criteria for the selection of a comprehensive and representative set of brands: first, salient well know brands; second, a wide variety of brands representing a range of personality types; third a range of product categories (Aaker, 1997).

Pilot Study

Respondents judged their own personality, the personality of the five brands and also rated their familiarity with the product and likelihood to buy the product. Each respondent was asked to use Goldberg's 50-item Big-Five Factor personality trait measure and the SAM manikins. Participants in the pilot study completed one set of 53 items for each of four brands. The pilot study collected data from 100 respondents.

SAM was first explained to respondents. The details were modified from the emotional response explanation to instead illustrate the use of SAM as a personality measure.

> Today we are using SAM to represent different aspects of personality. There are three (3) parts to SAM. Each is represented by a row of pictures. The first row goes from a very big smile to a very big frown. These figures represent the "agreeableness" of a person. They range from warm, kind, agreeable or fair on the left end of the row to disagreeable, cold, unkind or uncooperative on the right end of the row. The second row of SAM characters represents the "emotional stability" of a person. This aspect of a person can range from angry, tense, nervous, envious or moody on the left to calm, stable, secure, guilt-free or unemotional on the right. The third row of characters represents that part of personality that is introverted or extroverted. This aspect of a person's personality can range from unenergetic, silent, timid or unsociable for the small figure on the left, to enthusiastic, bold or spontaneous for the figure on the right. Please take a minute to look at each of the figures and think about the way each figure illustrates these different parts of a person's personality.

Next, the procedure of evaluating the brands first with the SAM scale and then with the verbal scale was explained.

> In the first part of each question, I'd like you to imagine what each of the following brands would be like if it were a person with a distinct personality. You will make three marks on each page. Place a mark below or between the figure on each row that best describes how you would describe the brand if it was alive as a person. In the second part of each question, (while still thinking about what each brand would be like if it were a person with a distinct personality), you will use words to indicate personality. For each pair of words, place a mark in the column that best describes what the brand would be like if it was alive as a person.

The first question asked respondents to judge their own personality, first using the visual SAM measure,

> First, please indicate as accurately as possible your personality. Please think about your answer carefully. (X ONE For EACH Row).

> Directions were then given for the 50-item verbal Goldberg scale,

> Please indicate as accurately as possible your personality. Please think about your answer carefully. If you identify more with a particular attribute, please "X" a box on the side closer to the attribute you identify with. If you don't identify

> with either of the attributes, please "X" the box under "Neither." (X ONE Box For EACH Row).

Following the self-report of personality, respondents were again given instructions for rating each of the five brands, first using the visual SAM scale,

> Now, what would _____ be like if it was alive as a person? Please think about your answer carefully. (X ONE For EACH Row).
>
> Directions were repeated for the 50-item verbal Goldberg scale,
>
> What would _____ be like if it was alive as a person? Please think about your answer carefully. If you identify more with a particular attribute, please "X" a box on the side closer to the attribute you identify with. If you don't identify with either of the attributes, please "X" the box under "Neither." (X ONE Box For EACH Row).

Using five-point scales, information was also collected on brand familiarity, "How familiar are you with _____? (X ONE Box)" and purchase intent, "If price was not an issue, how likely is it that you would buy _____? (X ONE Box)." Possible responses for the familiarity scale included "not familiar at all," "not very familiar," "neither familiar nor unfamiliar," "somewhat familiar" and "very familiar." For the purchase likelihood question possible responses were "not likely at all," "not very likely," "neither likely nor unlikely," "somewhat likely" and "very Likely."

The items in the Goldberg scale are anchored at each end by personality adjectives representing opposite ends of the attribute, such as "rude" to "polite" or "rash" to "cautious." Rating was done by checking boxes on a nine-point scale. Column headings of "Very—Moderate—Neither—Moderate—Very" further helped define the scale. This design follows Goldberg (Goldberg, 1992).

Survey completion rates and brand familiarity were of primary concern in the analysis of pretest results (Table 1). Completion rates for the 53 questions on brand personality ranged from 61 to 73 percent for the five brands in the study. The mean brand familiarity ratings ranged from a low of 2.74 for the MTV cable television network, to a high of 4.45 for Hallmark greeting cards. Generally, respondents who were more familiar with a brand completed a higher number of the personality questions. A visual examination of response score histograms for each variable was also conducted as a check of the shape of the distribution. From the results of this pretest is was decided that respondents were familiar with brands and answer completion rates were acceptable. No changes were made to the questionnaire.

Table 1 Pretest number of respondents completing questions and mean brand familiarity ratings

Question	**"n" Completing All 53 Questions**	**Mean Brand Familiarity**
My Personality	64	--
Hallmark Cards	73	4.45
MTV	61	2.74
The Wall Street Journal	67	2.94
Gerber Baby Foods	66	3.75
Mercedes Benz	61	3.18

Study

Sample

Because of the number of questions in the survey and the statistical techniques proposed for the final data analysis, the number of completed surveys in the final sample required was 1000. Response rates for National Family Opinion Research historically average around 40 percent. Using this figure as a guide, surveys were mailed to approximately 2,500 participants selected from the panel research pool. Responses from 1004 respondents were used in the final analysis for this project. The use of this national panel makes it possible to profile the survey participants on a large number of demographic variables. Most respondents (73.4%) were women age 40 to 49 (20.2%), married (61.1%), living in the south-Atlantic region of the U.S. (19.1%; of these, 29.1%

are living in Florida), in larger urban areas, (39.6% in MSA's over 2 million) and earning between $30,000 and $50,000 per year (22.2%). Most of these women live in a house (69.9%), which they are purchasing (73.8%). The largest percentage of these are two-person households (37.9%). These female respondents are white (87.3%), and only 3.8% speak Spanish. Many (40.6%) are employed full-time in managerial positions (24.7%) and have a two-year college degree or better (32.9%). Twenty-seven percent of respondents are classified as either working older couples or retired older couples. In these households, the head of the household is age 45 or over and there are no children present.

Questionnaire

Packets containing the two-page cover letter, 12-page questionnaire and postage paid return envelope were mailed to members of the panel. The survey was self-administered. The cover letter introduced the project saying,

> Dear NFO Member, Please give this letter and enclosed questionnaire to an adult female or male household member (this may be you). Thank you! TO THE HOUSEHOLD MEMBER HELPING WITH THIS STUDY: My questionnaire, which I think you will find interesting, is about how people apply human personality to everyday products. PLEASE REFER TO THE INSTRUCTIONS ON THE BACK OF THIS LETTER TO ASSIST YOU WITH THE COMPLETION OF THE QUESTIONNAIRE. Most of my questions can be easily answered by simply placing an "X" in the appropriate box or boxes. In the questions where I have asked you to write in your answers, please be as specific as possible. When you have completed the questionnaire, please return it to me in the enclosed postage-paid envelope. Thank you for your continued cooperation.

The questionnaire began by asking respondents to write in their age, and then check either male or female as gender. The first questions asked the respondent to rate their own personality, using the SAM three-row measure and then using the 50 verbal items of the Goldberg scale. This was followed by the questions for each of the five brands. Respondents answered all the questions for a single brand before proceeding to the next brand and repeating the questions. The brand was first judged using the SAM scale. This was followed by the question on brand familiarity and the question on purchase likelihood. Last were the questions on the Goldberg scale. Respondents repeated this process until all five brands had been rated. Completed surveys were returned to the NFOR data processing center in Toledo Ohio where the data was coded, cleaned and entered into ASCII text files.

Analysis Procedure

Because the objective of this study was to analyze the use of a three dimension SAM figure as a nonverbal method of brand personality measurement, personality scale items rather than respondents responses were used as the units of analysis. The structure of the concepts and the complex relationships between Goldberg's five personality dimensions and the three dimensional nature of the SAM scale were assessed using multivariate analysis techniques.

However, in this first stage of the research the variables of interest cannot be thought of as dependent and independent. This narrows the selection of techniques to one of several procedures measuring "interdependence" such as correspondence analysis, multidimensional scaling, cluster analysis or factor analysis (Hair et al., 1998). Factor analysis was chosen because it measures the relationship among variables (as opposed to objects such as brands in correspondence analysis and multidimensional scaling or cases/respondents in cluster analysis) (Hair et al., 1998).

Initial Data Inspection

Multivariate analysis techniques demand much more from the data than do univariate techniques. The power of a multivariate statistical technique requires larger data sets and more complex assumptions. The need to insure that statistical requirements are met requires careful inspection of the data before analysis.

Graphical Examination of the Data

Initial investigation of the variables was conducted by examining the shape of the distribution for each variable. This was accomplished using histogram plots. A normal curve was superimposed on the distribution. This was used to aid visual inspection of the normality of the distribution. Relationships between variables were examined using scatterplots of variables. This presentation is well suited for use with multivariate techniques (Hair et al., 1998).

Missing Values

In that missing values often represent some subset of the population, large numbers of missing values can impact the generalizability of the results. Generally, both the randomness and the number of missing values are important (Hair et al., 1998). For variables in this data set, missing values represented approximately one percent of total responses.

Outliers

Data was reviewed to identify cases with a unique combination of characteristics distinctly different from other observations (Hair et al., 1998). Since these cases cannot be categorized as either beneficial or problematic, they were reviewed to determine if the responses represented a valid segment of the population and to assess the influence of the responses on the overall analysis (Hair et al., 1998). Outliers were identified by converting data values to standardized scores. Respondents with scores ± 3 standard deviations from the mean were flagged (Hair et al., 1998). Twelve of the 53 variables had outliers. For these 12 variables, outlier percentages ranged from .57% to 1.57%.

Testing the Assumptions of Multivariate Analysis

The final step in examining the data involved testing the underlying assumptions necessary for multivariate analysis. Multivariate analysis requires the assumptions of normality, homoscedasticity, linearity and random error be tested for all variables.

Normality

Normality was examined by visually inspecting a histogram with a normal curve overlay and by computing the *z* statistic for skewness and kurtosis. A *z* statistic exceeding the critical value of ± 1.96 was taken as the indication of a non-normal distribution (Hair et al., 1998). Of the 55 variables in this study, 43 failed this test for kurtosis and 50 failed this test of skewness.

Homoscedasticity

Homoscedasticity, the assumption that the variance in dependent variables is equal across the range of the independent variables, allows for the "fair test" of the relationship across all values of the independent variable (Hair et al., 1998). The Levene test was used to assess the variance of individual variables across the brands. The Box's M test was used to test equality of variance / covariance matrices (Hair et al., 1998).

Linearity

A correlational measure of association is one of the assumptions of factor analysis (Hair et al., 1998). Because correlations represent only a linear association of variables, nonlinear effects are lost and the strength of the relationship may be underestimated (Hair et al., 1998). Scatterplots were used for the visual indication of linear relationships.

Stage One—Interdependence Analysis

Factor Analysis

A factor analysis was used in the first stage of this project because, as mentioned earlier, it is an interdependent multivariate technique in which all the variables are considered simultaneously, each related to all others. In this confirmatory factor analysis, the factors and the factor loadings of the Goldberg (1992) markers were known; however, the factor loadings of the SAM measures, while hypothesized, were unknown. The purpose of the factor analysis at this stage of the project was to identify the structure of the relationship between SAM and the five personality dimensions. This analysis would examine the relationship between the SAM variables and the dimensions of the five-factor model of personality.

Variable Selection and Measurement

The variables used in this analysis were all measured on interval scales. Using a scale developed by Goldberg (1992) allowed the use of a minimum number of variables thus reducing the possibility of chance significant correlation. With 10 items on each of the dimensions, the scales also satisfied the recommendation of five or more variables per factor (Hair et al., 1998). The Goldberg scales used adjectives that were "key markers" of facets on the big five dimensions thus aiding in both the validation of the SAM scale and the assessment of the practical significance of the results.

Necessary Assumptions for Factor Analysis

Statistical requirements of normality, homoscedasticity and linearity are not as strict for a factor analysis as for other multivariate procedures (Hair et al., 1998). Correlation between variables is necessary for a valid factor solution (Hair et al., 1998).

Correlations

The data matrix was first inspected to insure the presence of correlations above .30 in the matrix (Hair et al., 1998). An anti-image matrix was also computed to test partial correlations. A partial correlation removes the influence of other variables and reveals the existence of underlying factors. When underlying factors are present partial correlations are small, the variables are explained by the factors (Hair et al., 1998). A measure of sampling adequacy (MSA) was also obtained. The measure is calculated to aid in the evaluation of factor analysis as an appropriate procedure. Values above 0.5 are generally viewed as acceptable, values above 0.8 meritorious (Hair et al., 1998). The measure of sampling adequacy was .975 indicating that factor analysis is appropriate.

Principal Components Analysis

Two basic models are available for factor analysis, common factor analysis and component analysis. Component analysis is used to summarize variance in a minimum number of factors. Common factor analysis is used to identify dimensions that reflect what the variables share in common (Hair et al., 1998). Component analysis was chosen for this study because it considers total variance and factors contain little unique and error variance. In addition, common factor analysis may return estimates of communality that are invalid (greater than one or less than zero) making variables unusable and the method does not produce unique factor scores for respondents (Hair et al., 1998).

Extraction Criteria

For this confirmatory analysis the five factors dictated by the model were used as the criteria for factor extraction. The results were evaluated to confirm the theoretical assumptions that there were five independent factors: surgency, agreeableness, conscientiousness, emotional stability and intellect/sophistication. The percentage of explained variance was examined as an indicator of the importance of the factor. In social science research, solutions that account for 60 percent of total variance are often considered acceptable (Hair et al., 1998). And, a scree test, a plot of eigenvalue against factor number plotted by the order of extraction, was used to identify factors. Starting with the first factor, a scree test plot slops steeply. As more points are plotted, the slope begins to approach a horizontal line. The point at which the curve begins to straighten indicates the maximum number of factors to be extracted (Hair et al., 1998). This flattening of the curve is an indication that the common variance has been explained and unique variance has begun to dominate.

Factor Rotation

An unrotated factor solution was examined as a preliminary indication of the number of factors to extract. However, since factors are extracted in the order of importance, the first factor tends to be a general factor with significant loading of almost all the variables and thus did not produce a meaningful pattern of factor loading. For this reason, a second factor analysis using factor rotation was conducted. This was done to achieve a simpler, more meaningful explanation of the factors. There are two rotation techniques: oblique and orthogonal, and three orthogonal rotation methods: QUARTIMAX, VARIMAX and EQUIMAX.

The oblique rotation technique is more flexible because the factor axes are not forced to be independent. This may be a more realistic assumption in many cases since correlated dimensions often exist and are a possible result with an oblique solution. Since the dimensions of personality are most probably correlated this technique would appear to be appropriate. However, the nonorthogonal solution can also make the solution sample specific and because oblique rotation methods are still not well developed they are somewhat controversial (Hair et al., 1998). For these reasons, an orthogonal rotation was used in this study.

The focus of the QUARTIMAX rotation method is the variable (or matrix row) and not factor (or column). The goal of this rotation method is to maximize the loading of a variable on one factor and reduce the loading on all other factors (Hair et al., 1998). As with the unrotated solution, this often leads to one large factor with much less variance accounted for by subsequent factors. Conversely, a VARIMAX rotation attempts to simplify the column by maximizing the variance of that factor. The EQUIMAX rotation method is an attempt to achieve the best of both worlds, trying to simplify both the rows and columns of a factor matrix (Hair et al., 1998).

Since the focus of this project is on the big-five dimensions, and since Goldberg's work has identified the adjective markers (rows) used in the research, a VARIMAX rotation was selected as the rotation method for this step of the factor analysis. This rotation method was also used by Goldberg (1992) in his research.

Significant Factors

With sample sizes greater than 100 there are generally accepted guidelines for the practical significance of the factor loadings that can be quickly assessed by inspecting the factor matrix (Hair et al., 1998). Factor loadings greater than ± .3 are considered to meet the minimal level (Hair et al., 1998). Because factor loadings inherently contain large standard errors the statistical evaluation of the significance is much stricter (Hair et al., 1998). To achieve a statistical power level of .8 at a .05 significance level, the sample size must be larger than 350 for a loading of ± .3 to be considered significant. However, Costa and McCrae (1998) in a discussion of personality traits point out that many features of the person and the situation besides the trait help determine behavior in any given instance. Because of this, correlations may not be high. And, it is only when results are aggregated across many instances that features average out and the underlying pattern begins to emerge (Costa & McCrae, 1998). There are some disadvantages to this method. The number of variables being investigated and the specific factor being examined should also be considered. For each additional factor, both error and unique variance increase as a proportion of the total variance of the factor. As the number of variables increases the level of loading that is called "significant" should decrease. For all of these reasons, factor loadings were viewed from the standpoint that (1) larger sample size and a larger number of variables reduces the amount of loading necessary for significance and (2) loading on later factors must be larger to be considered significant.

Reliability and Validity

Following the results of Goldberg (1992), factor loadings were considered evidence of content or face validity. Reliability was assessed by computing the item-to-total correlation and the inter-item correlation for each variable. It is generally accepted that item-to-total correlations greater than .5 and inter-item correlations greater than .3 are significant (Hair et al., 1998). The reliability of the scale was assessed using Cronbach's alpha.

Stage Two—Dependence Analysis

The many different dependence multivariate techniques may be generally categorized using (1) the number of dependent variables and (2) the measurement scale used to measure those variables. In cases where a set of several dependent and independent relationships are thought to exist structural equation modeling is appropriateand useful (Hair et al., 1998). Multiple regression, multiple analysis of variance, discriminant analysis and the other multivariate techniques are all limited because they can examine only one relationship at a time. By contrast, structural equation modeling (SEM) examines a series of dependence relationships simultaneously (Hair et al., 1998). Structural equation modeling is of interest as a technique in this study because it provides a straightforward method of dealing with multiple relationships simultaneously and it also provides a transition from exploratory to confirmatory analysis. This aids in the development of a model for the use of SAM in personality measurement by testing a series or relationships between SAM and the big-five factors comprehensively. The purpose of the modeling effort here is to test and improve a model through modification.

Developing a Model

As noted above, structural equation modeling is one of the dependence techniques available in multivariate analysis. Thus, the technique is based on the assumption of causality in the relationship under investigation. These causal relationships can take many forms, but ultimately, the strength of the relationship is not determined by the analytical technique but by the theoretical justification. Four points are usually considered when establishing causality: (1) do you have correlation between variables, (2) does the cause precede the effect in time, (3) do other explaining variables exist, and (4) is there a theoretical basis for the relationship (Hair et al., 1998). Because of these reasons, the path diagram is an important step in the process. Figure 1 presents the path diagram and the resulting structural equations examined in this step of the project. The three SAM dimensions are conceptualized as having an impact on a corresponding facet of the Goldberg Model of personality. The top row of SAM, ranging from a smiling SAM to a frowning SAM, is conceptualized as representing the Goldberg dimension II, "Agreeableness." The second row of SAM, ranging from calm to excited, represents Goldberg dimension IV, "Emotional Stability." The third SAM row, showing a small picture of the character at one end of the scale and a much larger picture at the opposite end of the scale, represents Goldberg's dimension I, "Surgency" or "Introverted-Extroverted." In this model, personality is composed of the five Goldberg factors:

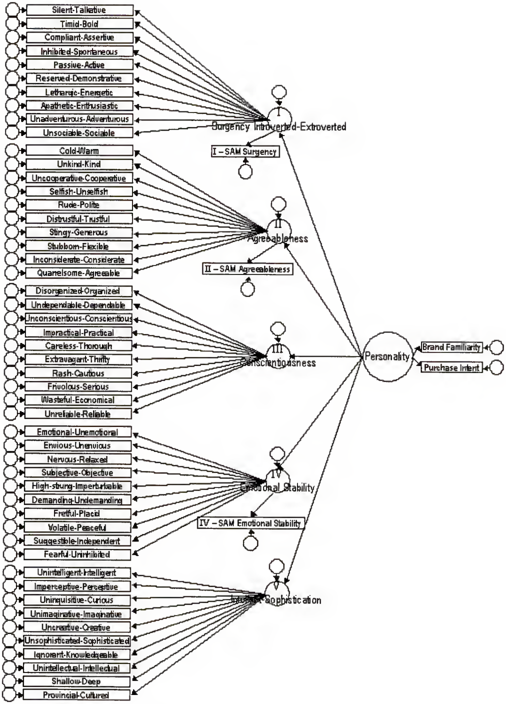

Figure 1 SAM – Personality Second Order Path Diagram

Introversion-Extroversion (I), Pleasantness or Agreeableness (II), Conscientiousness or Dependability (III), Emotional Stability (IV), and Intellect or Sophistication (V). Each of these five factors is measured using a 10-item scale. The semantic differential items are trait markers (Goldberg 1992). In the structural equation model, for each effect, a coefficient (*b*) is estimated and an error term (e) is estimated for each equation. This error term represents the sum of specification error and random measurement error (Figure 1).

Input Matrix

Structural Equation Modeling differs from other multivariate techniques in that either a correlation or variance-covariance matrix can be used as a data source for the analysis. The method was initially developed to use the variance-covariance matrix and because of this is sometimes referred to as "covariance structure analysis" (Hair et al., 1998). The covariance matrix is useful when the focus of the research is to provide comparisons across samples and populations or when a "true test" of theory is being performed since the variances and covariances satisfy the assumptions of the methodology. The correlation matrix is based on standardized values, making direct comparisons across model coefficients possible and interpretation easier. In addition, the estimates of significance are more conservative (Hair et al., 1998). The correlation matrix was used as the data source for this project.

Sample Size

As introduced above, for structural equation modeling, a sample size of approximately 200 respondents is adequate under most conditions. If possible model specification error is of concern, sample size should be increased so that misspecification can be detected. Typically the minimum ratio of respondents to parameters is five to one. A ratio of 10 to 1 is considered more appropriate (Hair et al., 1998). If the data are not normally distributed, the sample size must be increased to minimize the impact of sampling error. The most common used method of estimation is maximum likelihood. While the method is valid with sample sizes as small as 50, recommended samples are in the rage of 150 to 200. The sensitivity of this test increases with sample sizes making the test "too sensitive" with samples above 400 or 500 (Hair et al., 1998). Because of the sample size necessary for the factor analysis in stage one of this project, the sample size was adequate for this step in the analysis.

Offending Estimates

The results were first examined for offending estimates in three areas: (1) negative error variances or nonsignificant error variances for any of the constructs, (2) large (close to 1.0) standardized coefficients, (3) large standard errors associated with the coefficients.

Goodness-of-Fit

No one measure of goodness-of-fit gives complete assurance that the constructs meet the requirements and fit the model. Three types of measures are commonly employed: (1) absolute fit, (2) incremental fit measures, (3) parsimonious fit measures. Incremental and parsimonious measures provide comparison between models. Therefore, at this stage only absolute fit measures could be used to assess overall model fit. These included likelihood ratio chi-square, goodness-of-fit index and the root mean square residual.

Reliability

Loadings for PAD on each of the big-five factors were first examined as an indication of reliability. A threshold of .70 is generally an acceptable level although lower values are satisfactory in exploratory analysis (Hair et al., 1998). The reliability and the variance extracted were also computed for each of the five relationships. The construct reliability and variance extracted reliability should both exceed .50 (Hair et al., 1998).

Model Fit

The significance of estimated coefficients was examined first. Standard error and *t* values were examined for each coefficient. Given the statistical properties of the maximum likelihood method, the more conservative critical value of .025 was set as the threshold consideration of the results. As a measure of fit for the overall equation, the coefficient of determination (R^2) was inspected for the structural equation. There is no test for significance that can be preformed on this measure; however, it does provide a means of relative comparison. The correlation matrix of the constructs was also inspected. Although no value has been set for "high" correlations, it is suggested that values above .80 be investigated (Hair et al., 1998). In an effort to improve model fit and the correspondence between PAD and some, if not all, of the five personality factors, the model was modified and the process outlined above was repeated.

CHAPTER 4
RESULTS

Initial Data Inspection

Results of the Kolmogorov-Smirnov test for normality showed the distribution of all variables to be significantly different from a normal distribution with the test statistics ranging from .137 to .284. However, since the test is quite sensitive with large sample sizes, visual inspection of the variables, as well as skewness and kurtosis measures, also were examined. These results revealed most variables are not normally distributed. Intuitively, this is not surprising. The SAM and semantic scales used in this project all range from negative to positive attributes, from less appealing to more appealing personality adjectives. While individuals may have personalities that are characterized as "unsociable," "stubborn," "unreliable," "nervous" or ignorant," brands are actively managed to avoid such descriptions. In this study of well-known successful brands, we would expect few respondents to use negative terms when describing the brands.

Approximately 1% of the responses were missing in the data. The randomness of missing data was assessed through group comparisons of observations with missing versus valid data. Of the 2757 possible pair combinations, 22.8% or 629 pairs had $p < .05$. Means of missing versus nonmissing groups were not equal. In addition, Little's MCAR test of expectation-maximization indicated that the missing data could not be considered to be missing completely at random (Chi square = 17496.759, df = 14176, Prob = .000). Further, the Goldberg and SAM measures were converted to dichotomous missing/nonmissing values acting as independent variables and correlated with responses to the brand familiarity question. Eta values ranged from .269 to .288 (Eta^2 = 7.2% to 8.3%). Thus, missing values are only minimally associated with brand familiarity.

As a result of the diagnostic tests, no respondents demonstrated the characteristics of outliers that should be eliminated. Twelve of the variables, 22.6%, have some observations that are extreme. However, no respondents had a number of extreme scores deemed to be unrepresentative of the population.

The results of the Levene test for the metric variables across the groups defined by the categorical variable "Brand" shows significant heteroscedasticity for all variables. This results from the skewed distribution of the Goldberg and SAM variables.

Factor Analysis

Factor analysis was used at this stage of the investigation to provide insight into three areas. First, factor analysis was used as a step in the confirmation of the five-factor Goldberg model as appropriate for understanding consumers' perceptions of brand personality. Second, it was used as a step in analyzing the use of SAM in measuring three of the five dimensions of personality: surgency, agreeableness and emotional stability. And finally, factor analysis was used for data reduction combining or eliminating some variables to achieve a more parsimonious measure of brand personality.

Factor Analysis One

Correlations ranged from –0.07 for the variables "IV-SAM emotional stability" and "IV-fearful-uninhibited" to .924 for "I-reserved-demonstrative" and "IV-volatile-peaceful." Visual inspection of the anti-image matrix of partial correlations shows values to be small, supporting the appropriateness of factor analysis. Even though the measure of sampling adequacy is influenced by large sample size, high correlations, a large number of variables and a low number of factors, the result was well within what Hair describes as a "meritorious" range.

For confirmation of the Goldberg five-factor model, all 50 variables were entered into a principle components analysis with varimax rotation. Initial Eigenvales ranged from 22.96 to 1.36 for the five factors. Extraction communalities, representing the amount of the variable's variance accounted for by the five-factor solution, ranged from .559 for "envious-unenvious" to .876 for "inconsiderate-considerate." Total variance explained was 75.31%. The two strongest Goldberg dimensions, surgency and agreeableness clearly emerge in this solution. However, the dimensions of conscientiousness, emotional stability and intellect-sophistication each have confounded variables and variables that load on incorrect factors.

Dimension III–Conscientiousness

The semantic items "extravagant-thrifty," "rash-cautious," "frivolous-serious" and "wasteful-economical" each load on factor four, which is the emotional stability factor.

Dimension IV–Emotional Stability

Three of the 10 semantic differential items load on other factors. "Nervous-relaxed" and "volatile-peaceful" load on the emotional stability dimension, while the "fearful-uninhibited" item loads on factor five.

Dimension V–Intellect-Sophistication

Eight of the 10 markers for this dimension load with items from the conscientiousness dimension. Two items "unimaginative-imaginative" and "uncreative-creative" items load on the same factor as the 10 surgency items (Table 2).

Table 2 Goldberg Personality 50 Markers Factor Analysis

Rotated Component Matrix

	Component				
	1	2	3	4	5
Surgency – Introverted/Extroverted					
I-Silent-Talkative	0.034	0.034	**0.838**	0.009	-0.064
I-Timid-Bold	0.167	-0.133	**0.864**	0.013	-0.029
I-Compliant-Assertive	0.186	-0.163	**0.858**	0.053	-0.045
I-Inhibited-Spontaneous	-0.010	0.116	**0.871**	-0.014	0.117
I-Passive-Active	0.106	0.019	**0.912**	0.006	0.014
I-Reserved-Demonstrative	-0.043	0.129	**0.838**	-0.055	0.047
I-Lethargic-Energetic	0.072	0.145	**0.903**	-0.054	0.051
I-Apathetic-Enthusiastic	0.096	0.230	**0.873**	-0.052	0.062
I-Unadventurous-Adventurous	0.045	0.168	**0.867**	-0.074	0.119
I-Unsociable-Sociable	0.164	0.422	**0.677**	-0.062	0.104
Agreeableness					
II-Cold-Warm	0.185	**0.847**	0.239	0.073	0.129
II-Unkind-Kind	0.274	**0.852**	0.162	0.131	0.109
II-Uncooperative-Cooperative	0.353	**0.779**	0.187	0.192	0.066
II-Selfish-Unselfish	0.245	**0.818**	0.111	0.264	0.063
II-Rude-Polite	0.400	**0.778**	0.015	0.246	0.021
II-Distrustful-Trustful	0.501	**0.699**	0.092	0.202	0.006
II-Stingy-Generous	0.307	**0.794**	0.180	0.177	0.083
II-Stubborn-Flexible	0.287	**0.763**	0.205	0.190	0.083
II-Inconsiderate-Considerate	0.387	**0.823**	0.080	0.201	0.042
II-Quarrelsome-Agreeable	0.371	**0.807**	0.070	0.207	0.051
Conscientiousness					
III-Disorganized-Organized	**0.754**	0.315	0.128	0.236	-0.097
III-Undependable-Dependable	**0.741**	0.454	0.101	0.207	-0.069
III-Unconscientious-Conscientious	**0.677**	0.524	0.068	0.241	-0.059
III-Impractical-Practical	**0.568**	0.521	0.022	0.371	-0.141
III-Careless-Thorough	**0.727**	0.435	0.052	0.312	-0.111
III-Extravagant-Thrifty	0.125	0.387	-0.014	**0.671**	-0.166
III-Rash-Cautious	0.393	0.412	-0.114	**0.628**	-0.144
III-Frivolous-Serious	0.508	0.271	-0.068	**0.596**	-0.202
III-Wasteful-Economical	0.365	0.415	-0.020	**0.596**	-0.149
III-Unreliable-Reliable	**0.699**	0.420	0.027	0.314	-0.073
Emotional Stability					
IV-Emotional-Unemotional	0.205	-0.290	-0.121	**0.649**	-0.027
IV-Envious-Unenvious	0.236	0.241	0.034	**0.622**	0.238
IV-Nervous-Relaxed	0.331	**0.473**	0.030	0.471	0.354
IV-Subjective-Objective	0.409	0.265	0.064	**0.590**	0.156

Table 2 Continued

Rotated Component Matrix					
	Component				
	1	2	3	4	5
IV-High-strung-Imperturbable	0.311	0.311	-0.121	**0.672**	0.205
IV-Demanding-Undemanding	0.066	0.535	-0.059	**0.538**	0.287
IV-Fretful-Placid	0.247	0.486	-0.015	**0.549**	0.359
IV-Volatile-Peaceful	0.305	**0.616**	-0.121	0.470	0.248
IV-Suggestible-Independent	0.440	0.202	0.084	**0.469**	0.331
IV-Fearful-Uninhibited	0.265	0.169	0.391	0.252	**0.553**
Intellect/Sophistication					
V-Unintelligent-Intelligent	**0.850**	0.240	0.113	0.208	0.155
V-Imperceptive-Perceptive	**0.780**	0.306	0.185	0.168	0.212
V-Uninquisitive-Curious	**0.532**	0.227	0.371	0.134	0.323
V-Unimaginative-Imaginative	0.414	0.424	**0.452**	-0.042	0.420
V-Uncreative-Creative	0.406	0.442	**0.459**	-0.050	0.406
V-Unsophisticated-Sophisticated	**0.833**	0.183	0.093	0.167	0.153
V-Ignorant-Knowledgeable	**0.862**	0.235	0.142	0.183	0.112
V-Unintellectual-Intellectual	**0.874**	0.186	0.090	0.193	0.117
V-Shallow-Deep	**0.720**	0.292	0.069	0.266	0.130
V-Provincial-Cultured	**0.775**	0.189	0.113	0.182	0.173

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 7 iterations.

As a general rule of "practical significance" Hair et al. (1998) suggest factor loadings of ±.30 to meet a minimal level of usefulness and loadings of ±.50 to be "practically significant." The squared loading is the amount of the variable's total variance accounted for by the factor, thus a factor loading must exceed .70 before it accounts for 50% of the variance. Variable loading are shown in Table 2 and total variance explained by the five-factor solution is shown in Table 3.

Goldberg's five-factor model provided the theoretical basis for evaluating variables and then retaining or deleting them from the second factor analysis. A variable's absolute factor loading, shared loading and communality were all considered. Variables were included or deleted from the second factor analysis based on their contribution to the replication of the Goldberg five-factor model.

Table 3 Goldberg Personality 50 Markers Total Variance Explained

	Total Variance Explained					
	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	22.961	45.923	45.923	10.930	21.859	21.859
2	7.978	15.956	61.878	10.819	21.638	43.497
3	3.273	6.546	68.425	8.413	16.825	60.322
4	2.081	4.162	72.587	5.669	11.339	71.661
5	1.362	2.724	75.311	1.825	3.650	75.311

Based on evaluations of the factor loadings and communalities, 15 marker variables were dropped from this analysis. Four variables from the conscientiousness dimension were dropped: "extravagant-thrifty," "rash-cautious," "frivolous-serious" and "wasteful-economical." From the emotional stability dimension "volatile-peaceful," "suggestible-independent" and "fearful-uninhibited" were dropped. And from dimension five, the intellect/sophistication dimension, 8 of the 10 pairs were eliminated from the final factor solution; only the "unimaginative-imaginative" and "uncreative-creative" marker pairs were retained for the final analysis.

Factor Analysis Two

Table 4 shows the results of the factor analysis derived on the reduced set of 35 variables. Again, the variables were entered into a principle components analysis with varimax rotation. Initial Eigenvales ranged from 15.91 to .867 for the five factors. Total variance explained was 78.85% (Table 5). All five Goldberg dimensions clearly emerge in this solution. Extraction communalities, ranged from .613 for "envious-unenvious" to .924 for "unimaginative-imaginative."

Table 4 Goldberg Personality 35 Markers Factor Analysis

Rotated Component Matrix					
	Component				
	1	2	3	4	5
Surgency–Introverted/Extroverted					
I-Silent-Talkative	0.050	**0.835**	0.037	-0.020	-0.030
I-Timid-Bold	-0.105	**0.878**	0.164	0.023	-0.053
I-Compliant-Assertive	-0.128	**0.870**	0.188	0.051	-0.068
I-Inhibited-Spontaneous	0.134	**0.868**	-0.066	0.013	0.108
I-Passive-Active	0.037	**0.914**	0.080	0.012	0.042
I-Reserved-Demonstrative	0.135	**0.828**	-0.085	-0.049	0.107
I-Lethargic-Energetic	0.151	**0.900**	0.036	-0.034	0.108
I-Apathetic-Enthusiastic	0.234	**0.867**	0.053	-0.031	0.144
I-Unadventurous-Adventurous	0.174	**0.855**	-0.021	-0.036	0.198
I-Unsociable-Sociable	0.421	**0.667**	0.098	-0.017	0.217
Agreeableness					
II-Cold-Warm	**0.855**	0.225	0.129	0.075	0.182
II-Unkind-Kind	**0.869**	0.151	0.220	0.123	0.154
II-Uncooperative-Cooperative	**0.809**	0.181	0.313	0.175	0.083
II-Selfish-Unselfish	**0.842**	0.100	0.215	0.225	0.077
II-Rude-Polite	**0.804**	0.016	0.376	0.215	0.051
II-Distrustful-Trustful	**0.721**	0.093	0.497	0.181	0.052
II-Stingy-Generous	**0.811**	0.170	0.273	0.163	0.117
II-Stubborn-Flexible	**0.777**	0.194	0.254	0.178	0.124
II-Inconsiderate-Considerate	**0.837**	0.077	0.362	0.181	0.105
II-Quarrelsome-Agreeable	**0.822**	0.068	0.357	0.191	0.078
Conscientiousness					
III-Disorganized-Organized	0.309	0.133	**0.798**	0.229	0.081
III-Undependable-Dependable	0.440	0.106	**0.790**	0.201	0.110
III-Unconscientious-Conscientious	0.514	0.069	**0.716**	0.224	0.111
III-Impractical-Practical	0.505	0.008	**0.638**	0.279	0.070
III-Careless-Thorough	0.431	0.055	**0.770**	0.269	0.072
III-Unreliable-Reliable	0.420	0.029	**0.736**	0.268	0.081
Emotional Stability					
IV-Emotional-Unemotional	-0.237	-0.098	0.228	**0.656**	-0.266
IV-Envious-Unenvious	0.281	0.034	0.180	**0.706**	0.049
IV-Nervous-Relaxed	0.489	0.034	0.235	**0.598**	0.227
IV-Subjective-Objective	0.286	0.063	0.368	**0.652**	0.101
IV-High-strung-Imperturbable	0.345	-0.117	0.266	**0.732**	0.046
IV-Demanding-Undemanding	0.569	-0.070	-0.013	**0.575**	0.084
IV-Fretful-Placid	0.528	-0.013	0.164	**0.606**	0.132
Intellect/Sophistication					
V-Unimaginative-Imaginative	0.364	0.413	0.262	0.108	**0.735**
V-Uncreative-Creative	0.383	0.421	0.252	0.101	**0.723**

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 7 iterations.

Table 5 Goldberg Personality 35 Markers Total Variance Explained

Total Variance Explained						
	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	15.914	45.468	45.468	9.632	27.520	27.520
2	7.174	20.497	65.965	7.860	22.458	49.978
3	2.156	6.160	72.125	4.909	14.027	64.005
4	1.488	4.251	76.375	3.651	10.432	74.437
5	0.867	2.478	78.853	1.546	4.417	78.853

Factor Analysis Three

A final factor analysis was conducted using the 35 Goldberg personality markers and the three SAM variables. Again, a principle components analysis was used with a varimax rotation. Factor loadings are presented in Table 6 and the total variance explained in Table 7.

Total variance explained for this 38 variable solution is lower, at 57.92%, due in part to the lower communalities of the three SAM measures, "I-SAM Surgency–Introverted Extroverted" = .514, "SAM Emotional Stability" = .412 and "SAM Agreeableness" = .356. Eigenvalues ranged from 10.84 to 1.35. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .918 (Approx. Chi-Square = 14223.11, df = 703, Prob = .000).

Dependence Analysis

Missing Data

As discussed by Byrne (2001), missing data is almost inevitable in survey research and may be caused by any number or reasons. A large percentage of cases with incomplete data can seriously bias results, yet clear guidelines do not exist for handling missing data. The AMOS (Arbuckle, 1999) structural equation modeling software

Table 6 Goldberg Personality 35 Markers Plus 3 SAM Variables Factor Analysis

Rotated Component Matrix

	Component				
	1	2	3	4	5
Surgency – Introverted/Extroverted					
I-SAM Surgency - Introverted Extroverted	**0.682**	0.159	0.011	0.144	-0.048
I-Silent-Talkative	**0.749**	0.157	0.004	-0.055	0.075
I-Timid-Bold	**0.767**	-0.079	0.107	0.095	0.075
I-Compliant-Assertive	**0.709**	-0.149	0.197	0.004	0.139
I-Inhibited-Spontaneous	**0.717**	0.083	-0.053	0.126	0.230
I-Passive-Active	**0.785**	0.111	0.140	0.141	0.016
I-Reserved-Demonstrative	**0.755**	0.117	-0.057	-0.032	0.090
I-Lethargic-Energetic	**0.635**	0.281	0.201	0.133	-0.041
I-Apathetic-Enthusiastic	**0.670**	0.363	0.135	0.083	0.063
I-Unadventurous-Adventurous	**0.577**	0.163	0.041	0.148	0.283
I-Unsociable-Sociable	**0.639**	0.409	-0.017	0.068	0.072
Agreeableness					
II-SAM Agreeableness	0.312	**0.461**	-0.077	0.185	-0.078
II-Cold-Warm	0.292	**0.730**	0.089	0.065	0.074
II-Unkind-Kind	0.130	**0.786**	0.253	0.032	0.062
II-Uncooperative-Cooperative	0.127	**0.707**	0.304	0.125	-0.052
II-Selfish-Unselfish	0.055	**0.658**	0.312	0.074	-0.005
II-Rude-Polite	0.005	**0.742**	0.292	0.092	-0.011
II-Distrustful-Trustful	0.165	**0.522**	0.116	0.091	0.047
II-Stingy-Generous	0.154	**0.627**	0.186	0.086	0.192
II-Stubborn-Flexible	0.165	**0.631**	-0.010	0.254	0.140
II-Inconsiderate-Considerate	0.068	**0.675**	0.406	0.053	0.138
II-Quarrelsome-Agreeable	0.026	**0.660**	0.107	0.361	0.024
Conscientiousness					
III-Disorganized-Organized	0.078	0.032	**0.681**	0.053	-0.001
III-Undependable-Dependable	0.079	0.300	**0.805**	0.009	0.093
III-Unconscientious-Conscientious	0.117	0.385	**0.684**	0.035	0.088
III-Impractical-Practical	0.045	0.189	**0.754**	0.151	0.025
III-Careless-Thorough	0.043	0.185	**0.807**	0.078	0.065
III-Unreliable-Reliable	0.053	0.290	**0.764**	-0.007	0.112
Emotional Stability					
IV-SAM Emotional Stability	-0.074	-0.153	0.081	**-0.582**	0.196
IV-Emotional-Unemotional	0.040	-0.180	0.109	**0.615**	-0.069
IV-Envious-Unenvious	0.168	0.188	0.212	**0.473**	0.052
IV-Nervous-Relaxed	0.191	0.180	0.009	**0.745**	0.150
IV-Subjective-Objective	0.249	0.124	0.240	**0.538**	0.142
IV-High-strung-Imperturbable	0.029	0.079	0.017	**0.795**	0.121
IV-Demanding-Undemanding	-0.155	0.379	-0.023	**0.598**	0.043
IV-Fretful-Placid	0.091	0.227	0.017	**0.740**	0.058

Rotated Component Matrix					
	Component				
	1	2	3	4	5
Intellect/Sophistication					
V-Unimaginative-Imaginative	0.324	0.129	0.160	0.065	**0.823**
V-Uncreative-Creative	0.275	0.155	0.149	0.104	**0.824**

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 7 iterations.

Table 7 Goldberg Personality 35 Markers Plus 3 SAM Variables Total Variance

Total Variance Explained						
	Initial Eigenvalues			**Rotation Sums of Squared Loadings**		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	10.841	28.529	28.529	6.095	16.038	16.038
2	4.418	11.626	40.155	6.093	16.035	32.073
3	3.150	8.290	48.445	4.268	11.231	43.305
4	2.253	5.929	54.374	3.774	9.932	53.237
5	1.348	3.547	57.921	1.780	4.684	57.921

estimates missing values based on maximum likelihood estimation. This method of estimating missing values has long been recognized but not widely used, perhaps because the technique was not available in the most widely used computer programs (Byrne, 2001). Estimating missing values using maximum likelihood techniques offers several advantages over listwise and pairwise methods, most importantly for this project, when missing values are NMAR (not missing at random and therefore not ignorable, all data replacement procedures can yield biased results. However maximum likelihood estimates will exhibit the least bias (Byrne, 2001).

Approximately 1% of the responses were missing in the data. The randomness of missing data was assessed through group comparisons of observations with missing versus valid data. Of the 2757 possible pair combinations, 22.8% or 629 pairs had $p < .05$. Means of missing versus nonmissing groups were not equal. In addition, Little's

MCAR test of expectation-maximization indicated that the missing data could not be considered to be missing completely at random (Chi square = 17496.759, df = 14176, Prob = .000).

Nonnormally Distributed Data

Even though critically important for structural equation modeling, in practice most data fail to meet the assumption of multivariate normality (Byrne, 2001). One approach used to correct for multivariate nonnormal data is a procedure commonly known as "bootstrapping." With this technique the original data sample is used to produce multiple additional samples. The parent sample is considered to represent the population and multiple random subsamples of the same size as the parent are drawn with replacement (Byrne, 2001). In structural equation modeling, the bootstrap procedure allows for the analysis of data when the assumptions of multivariate normality may not hold. The procedure was used for this analysis and 500 random subsamples of the same size as the parent sample were drawn with replacement.

First Model with Estimated Missing Values

The structural equation model was constructed (Figure 2) using the reduced set of 35 Goldberg items and the three SAM measures. The resulting model was composed of 87 variables, 38 observed and 49 unobserved. Of these 87 variables, 43 were endogenous (dependent): 35 Goldberg items, the three SAM measures and the five personality dimensions (Surgency, Agreeableness, Conscientiousness, Emotional Stability and Intellect). The 44 exogenous variables resulted from independent error terms, residuals and the overall unobserved construct of "personality." There were 86 regression weights in the model: 48 fixed weights, from the error terms and the first of each set of five personality dimensions and 38 estimated weights. There were 44 variance terms: one

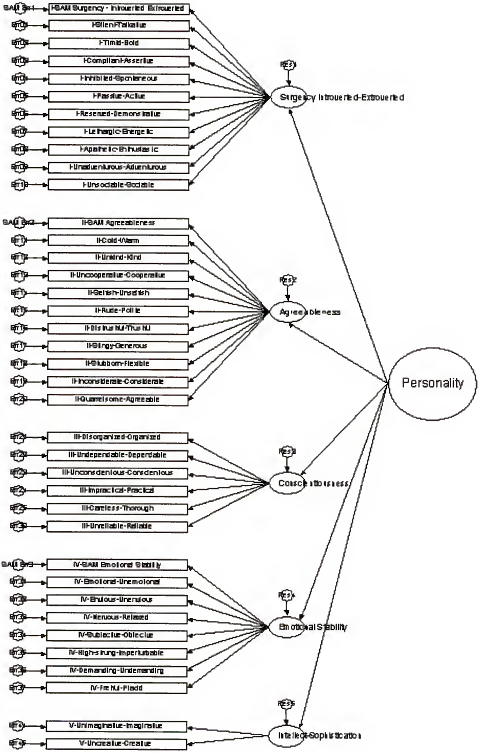

Figure 2 SAM–Personality Second Order Path Diagram
35 Goldberg Items 3 SAM Measures

fixed for the overall construct of "personality," the others from the 35 Goldberg items, the three SAM measures and the five personality dimensions. In the first test of the model, missing values were estimated using the maximum likelihood method discussed above and 38 intercepts are included in the model. In total there were 168 parameters in the model, 119 of which are estimated. Computing the sample covariance matrix yields 779 sample moments. From this information we can conclude that we have an overidentified model with 660 degrees of freedom.

The initial step in assessing the fit of the parameters was the examination of estimated values, checking parameter estimates for sign, size and consistency. Standard errors were also visually inspected to insure they were neither excessively large or small. The statistical significance of the parameter estimates was checked using the critical ratio test statistic, in effect a z-statistic, provided in the AMOS output. An examination of this solution reveals that all standard errors appear reasonable and all estimates appear reasonable and are statistically significant.

Several practical or subjective goodness of fit statistics are provided in the AMOS output file. The Bentler and Bonett normed fit index (NFI); a derivative of the normed fit index, the relative fit index (RFI), and the comparative fit index (CFI), which takes into account the sample size are all included in the output. Values for these indices range from zero to one with values close to .95 have been suggested as representing a superior-fitting model (Byrne, 2001). For this model, NFI = .959, RFI = .954 and CFI = .960.

Fit indexes relating to model parsimony include the James PRATIO and the PGFI computed relative to the NFI and CFI (Byrne, 2001). For this model PRATIO = .891, PNFI = .854 and PCFI = .855.

Byrne suggests the root mean square error of approximation (RMSEA) is one of the most informative criteria in SEM modeling (Byrne, 2001). Values as high as .08 represent reasonable errors of approximation, values as high as .1 indicate a mediocre fit. However, it should be remembered that these are subjective criteria. To aid in the assessment of RMSEA values, 90% confidence intervals are also included. Narrow confidence intervals being an indication of precision of the RMSEA value in reflecting model fit in the population (Byrne, 2001). For this model, RMSEA=.080 and a 90% interval around RMSEA from .079 to .081.

Second Model with Bootstrap Sample

The second test of the model was run using sample bootstrapping. Cases with missing values were first deleted from the data and then 500 bootstrap samples were generated. Again the model has of 87 variables, 38 observed and 49 unobserved. Of these 87 variables, 43 are endogenous and 44 exogenous variables. There are 86 regression weights in the model: 48 fixed weights and 38 estimated weights. There are 44 variance terms. There are 130 parameters in the model, 81 of which are estimated. Computing the sample covariance matrix yields 741 sample moments. From this information we can conclude that we have an overidentified model with 660 degrees of freedom.

The statistical significance of the parameter estimates was checked using the critical ratio test statistic, in effect a z-statistic, provided in the AMOS output. An examination of this solution reveals that all standard errors appear reasonable and all estimates appear reasonable and are statistically significant.

Practical or subjective goodness of fit statistics for this model are GFI = .696, AGFI = .659 and PGFI = .620. Normed fit index for this model are NFI = .862, RFI = .853 and CFI = .866. Model parsimony measures were PRATIO = .939, PNFI = .805 and PCFI = .813. Root mean square error of approximation RMSEA = .093 and a 90% interval around RMSEA from .091 to .094.

Other Model Comparisons

Three other SEM models were constructed and tested in a relative comparison of model adequacy (Table 8). The 50 item set of Goldberg items, the 35 set of Goldberg markers and the three item set of SAM measures were each modeled to assess the relative strength of the model and the impact of the changes in scale items.

Table 8 Goodness of Fit Comparison

Goodness of Fit	**50 item Goldberg Scale**	**35 item Goldberg Scale**	**3 item SAM scale**
NFI	0.936	0.959	0.993
RFI	0.93	0.953	0.957
CFI	0.938	0.96	0.993
PRATIO	0.918	0.881	0.167
PNFI	0.859	0.845	0.165
PCFI	0.86	0.846	0.165
RMSEA	0.087	0.085	0.19

As expected, model fit improves slightly with the 35-item Goldberg scale, but decreases for the three-item SAM scale. The SAM scale represents three of the five Goldberg personality dimensions, and as such does not completely describe the concept of personality.

Model Specification

Each of the above measures examines the overall model and not areas of fit within the model. Fit between the hypothesized covariance model and the sample covariance matrix is captured by the residual covariance matrix. There is one residual for each pair of observed variables. Because residuals depend upon individual units of measurement they can be difficult to interpret and standardized values are typically examined. These standardized residuals are analogous to *Z* scores and, in essence, represent the number of standard deviations the observed residual are from the zero residuals of a perfect model. Byrne considers values >± 2.58 as large (Byrne, 2001). However, Schumacker and Lomax make no reference to discount standardized residual covariances as high as six and state that researchers should look to the theoretical model for guidance and use the indicators as potential indicators of misfit and not a mandate for respecifying the model. Of the 630 elements in the standardized residual matrix from the 35 item Goldberg scale, over 49% were values >± 2.58 and nearly 20% were values >± 6.00.

The modification index was also computed for each fixed parameter in the model. The index measures how much the overall chi-square will decrease if the parameter is freely estimated and may be interpreted as a c^2 with one degree of freedom. Thus, freely estimating parameters with large indexes will improve model fit. Also reported is an expected parameter change value. This value is an approximation of the value that a parameter would take if freely estimated. Parameters with large modification indexes and large expected parameter change values should be freed first, provided it makes substantive sense to do so. These parameters are associated with higher probabilities of being false. Parameters associated with large modification indexes and small expected parameter change estimates may reflect a sample size sensitivity problems. Parameters associated with small modification indexes and large expected parameter change values may also reflect a sample size problem. Nevertheless, there may be substantive value in reestimating the model with this parameter freed because of the large contribution it would be expected to make. Finally, parameters associated with small modification indexes and small expected parameter change values can be ignored. The 25 largest modification indexes from the Goldberg 35 item scale are presented in Table 9. The modification indexes from the SAM scale are presented in Table 10.

Table 9 Largest Modification Indexes for Regression Weights

Modification Indexes for Regression Weights			**MI**	**Expected Parameter Change (EPC)**
Intellect Sophistication	←	Surgency Introverted Extroverted	795.957	0.587
I-Unsociable-Sociable	←	Agreeableness	662.164	0.317
I-Unsociable-Sociable	←	Personality	579.631	0.578
Surgency Introverted Extroverted	←	Intellect Sophistication	477.167	0.274
I-Unsociable-Sociable	←	Conscientiousness	350.074	0.245
I-Unsociable-Sociable	←	Emotional Stability	322.826	0.290
I-Unsociable-Sociable	←	Intellect Sophistication	283.613	0.210
IV-Emotional-Unemotional	←	Intellect Sophistication	277.178	-0.355
IV-High-strung-Imperturbable	←	Surgency Introverted Extroverted	232.742	-0.286
I-Compliant-Assertive	←	Agreeableness	227.785	-0.161
Surgency Introverted Extroverted	←	Agreeableness	219.698	-0.312
II-Cold-Warm	←	Surgency Introverted Extroverted	215.341	0.225
I-Timid-Bold	←	Agreeableness	209.215	-0.148
Emotional Stability	←	Surgency Introverted Extroverted	209.141	-0.213
I-Apathetic-Enthusiastic	←	Agreeableness	207.903	0.112
II-Rude-Polite	←	Surgency Introverted Extroverted	201.03	-0.198
I-Apathetic-Enthusiastic	←	Personality	173.797	0.200
II-Distrustful-Trustful	←	Conscientiousness	170.243	0.138
IV-Emotional-Unemotional	←	Surgency Introverted Extroverted	158.82	-0.377
IV-High-strung-Imperturbable	←	Intellect Sophistication	143.034	-0.159
I-Timid-Bold	←	Personality	122.567	-0.221
I-Compliant-Assertive	←	Personality	121.865	-0.230
IV-Emotional-Unemotional	←	Personality	117.633	-0.445
II-Cold-Warm	←	Conscientiousness	110.121	-0.121
I-Apathetic-Enthusiastic	←	Conscientiousness	101.461	0.083

The results of the structural equation results from the second order model (Figure 3) show that personality is predicted by the three SAM measures and the Goldberg items. The critical ratios indicate all values are significant. In the final model (Figure 4) the Goldberg items have been removed and personality is predicted using only the three visual SAM scales. Again, personality is predicted from the measures and all values significant.

Table 10 Modification Indexes for SAM Measures

Modification Indexes			**MI**	**Expected Parameter Change (EPC)**
For Covariances				
I-SAM Err	←	Personality	81.642	-0.426
V-SAM Err	←	I-SAM Err	133.956	1.023
II-SAM Err	←	I-SAM Err	20.050	0.334
II-SAM Err	←	V-SAM Err	48.840	0.596
For Variances				
		Personality	16.763	-0.175
For Regression Weights				
I-SAM Surgency – Introverted Extroverted	←	Personality	81.642	-0.426
I-SAM Surgency – Introverted Extroverted	←	IV-SAM Emotional Stability	168.754	0.200
I-SAM Surgency – Introverted Extroverted	←	II-SAM Agreeableness	57.433	-0.127
IV-SAM Emotional Stability	←	I-SAM Surgency	96.918	0.182
IV-SAM Emotional Stability	←	II-SAM Agreeableness	13.877	-0.069
I-SAM Agreeableness	←	I-SAM Surgency	15.722	-0.065
I-SAM Agreeableness	←	IV-SAM Emotional Stability	44.003	-0.100

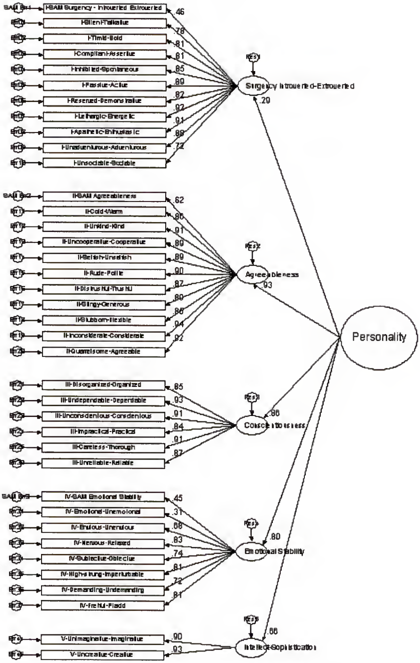

Figure 3 SAM – Goldberg – Personality Second Order Path Diagram with Standardized Regression Weights. 35 Goldberg Items 3 SAM Measures

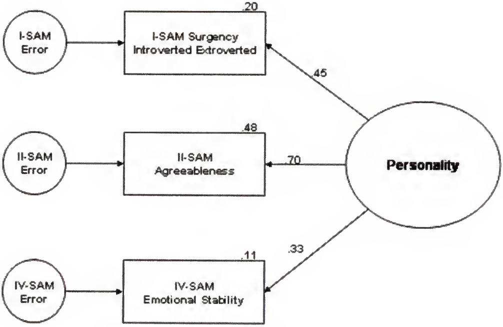

Figure 4 SAM – Personality Path Diagram with Standardized Regression Weights

CHAPTER 5
SUMMARY AND CONCLUSIONS/DIRECTIONS FOR FUTURE RESEARCH

Summary of Findings

Since the 1950s, many researchers have generally agreed meaning can be accounted for using a limited set of factors—evaluation, potency and activity (Solomon, 1954; Tucker, 1955; Osgood, Suci, & Tannenbaum, 1957; Bush, 1973). Later authors also suggest that a limited set of basic responses exist for all stimulus situations (Aaker et al., 1988; Batra & Holbrook, 1990; Holbrook & O'Shaughnessy, 1984; Rossiter & Percy, 1991). Three dimensions, pleasure, arousal, and dominance, constitute the common core of human emotional responses to all situations (Mehrabian, 1995) and may be used as the basis of a comprehensive description of individual differences on three nearly independent axes of a temperament space (Mehrabian, 1996). Peabody and Goldberg (1989) were able to incorporate these three factors into the Big-Five structure, thus linking the meaning and emotion models with currently accepted models of personality. To measure these theoretical constructs, semantic scales have been developed that measure meaning (Osgood, Suci, & Tannenbaum, 1957), emotion (Mehrabian, 1995) and personality (Goldberg, 1992). A visual scale, known as the Self Assessment Manikin (SAM), has also been developed to measure emotional response (Lang, 1980).

This study explores the use of visual and verbal scales as tools for measuring the Goldberg personality factors in brands. Respondents judged their own personality, the personality of the five brands and also rated their familiarity with the product and likelihood to buy the product. Each respondent was asked to use Goldberg's 50-item Big-Five Factor personality trait measure and the SAM manikins to measure brand personality. Participants completed one set of 53 items for each of four brands.

In the initial confirmatory factor analysis, the 50-item Goldberg scale reproduced the two most invariant (Goldberg, 1993b) dimensions, (I-Surgency—Introverted/ Extroverted and II-Agreeableness), with all 20 items appropriately loaded. The full 50-item scale less adequately reproduced dimensions three, four and five. Across these last three dimensions (Conscientiousness, Emotional Stability and Sophistication) 15 items were confounded. As a consequence, a model generating factor analysis was conducted in which individual scale items were eliminated based on factor loading and communalities. This resulted in a 35-item scale that accurately reproduced the Goldberg five-factor model of personality and accounted for 78.85% of the variance.

A factor analysis of a scale composed of the 35 Goldberg items and the three SAM items also reproduced the Goldberg dimensions with the SAM items loading on the hypothesized "appropriate" factor—row three of SAM loading with the Surgency items of dimension one; row one of SAM with the second dimension, Agreeableness and row two of SAM loading with the emotional stability items of dimension four.

Each row of SAM consists of five drawings representing the possible range of reactions. Beneath each row of figures is a row of nine small circles. Respondents record their reactions in these circles in the same way they record or "bubble" their answers on computer read score sheets. Respondents mark one of nine possible reactions on each of the three rows. These reactions represent a position directly beneath or between the five figures on the row. The top row of SAM ranges from a figure with a broad smile to a frowning figure. The second row shows figures ranging from an excited figure to a calm figure, the third row's figures run from very small to very large. When SAM is used in emotional response measurement these three rows represent pleasure, arousal and dominance respectively. For personality measurement, the rows might be named for the personality dimension they represent: agreeableness, emotional stability and surgency.

Personality is conceptualized as a higher order factor, a combination of the five lower order dimensions. As such it does not have its own set of measured indicators but is linked indirectly to the measured items through the lower order dimensions. A structural equation model was constructed based on this theorized relationship (Figure 2). In this model, the 35 survey items of the Goldberg scale and the three items of the SAM scale are the direct measures of the five first order dimensions of personality. Personality is measured indirectly from the first order factors and is considered to be the higher second order factor. Based on the results of the structural equation modeling, it appears that the second order path model is successful in predicting personality.

A structural equation path model was also created using only the three items of the SAM scale as predictors of personality. In this first-order model the standardized regression weights were, Surgency .45, Agreeableness .70 and Emotional Stability .33. Squared multiple correlations were .19 for Surgency, .49 for Agreeableness and .11 for Emotional Stability. With all critical ratios significant, the results appear to show SAM as a tool capable of predicting these three dimensions of personality.

Discussion

The results of the factor analysis and structural equation modeling of the reduced set of Goldberg items appears to show consumers model brand personality along the same dimensions they use for assessing human personality. The factor analysis reproduces all five factors the Goldberg model. The analysis produces all five dimensions and the solution explains 79% of the variance. In the structural equation model of the reduced set of Goldberg items, all critical ratios are significant. The standardized regression weights are Surgency-Personality .263, Conscientiousness-Personality .851, Agreeableness-Personality .929, Emotional stability-Personality .794 and Sophistication-Personality .631. The items on the reduced scale are able to adequately predict the first level factors. Squared multiple correlations are Surgency .069, Conscientiousness .725, Agreeableness .864, Emotional stability .631 and Sophistication .398.

Mean scores for individual brands on the five dimensions also offers support for the model. MTV is seen as less conscientious than "My Personality" (4.42 versus 7.19) and "My Personality" (6.81) is more sophisticated than MTV (4.13) and Gerber (6.59), but less sophisticated than Mercedes (6.96).

In this study, while the description of what the SAM figures represent was changed (for instance an agreeable aspect of personality versus a pleasurable emotional reaction) and the instructions given to the respondents were changed from measuring emotion to measuring personality, the drawings themselves were not changed. This resulted in a visual scale that did not measure what often emerges as the third factor of personality, Conscientiousness, but instead measured the fourth of the five dimensions, Emotional Stability. However the same order of dimension importance seems to hold—Agreeableness accounting for the most variance followed by Surgency and finally Emotional Stability. The visual model explains 79% of the variance. This further lends support to the idea that consumers use the same construct to gage both human and brand personality and a visual instrument can measure that construct. Not only do the same factors emerge when the visual SAM measure is used, but the factors emerge with the same relative factor loadings as when respondents rate human personality.

Application of the Findings

As more and more brands enter already crowded product categories differentiating one product from another becomes increasingly difficult. Marketers attempt to position products with very similar features as "very different" from one another. The "large economy size 16 ounce package" is no longer enough to do that. Products are sold based on style, attitude, emotion and brand personality. Consumers are courted based on psychographic characteristics. Measuring differences in attitude, emotion or psychographics requires the use of advanced theories and constructs about the relationships between products and consumers. Brand personality is one of the complex constructs consumers use to differentiate products and brands. Because of this complexity, instruments to measure differences between brands and consumers have been difficult to create. With no widely accepted instrument or scale for measuring brand personality, a quick, projective test with broad applicability based on accepted personality theory provides marketing researchers with a useful tool.

The 50-item Goldberg scale used in this study appears to be adequate for measuring the dimensions of the Five Factor Model, and thus the dimensions of brand personality using a widely accepted model. In turn, the Five-factor Model can be tied to commonly used personality measures (Costa, 1991; Costa & McCrae, 1985, 1988a, 1988b, 1992a, 1992b; Costa et al., 1991; McCrae, 1992; McCrae & Costa, 1985a; McCrae & John, 1992). The scale is relatively quick to use and provides researchers with a profile of their brand along the easily understood dimensions of Surgency, Agreeableness, Conscientiousness, Emotional Stability and Sophistication.

Table 11 Brand Mean Scores for Five Factor Personality Model Dimensions

	Surgency - Introverted Extroverted	**Agreeablenes s**	**Conscientious**	**Emotional Stability**	**Sophisticatio n**
My Personality	*5.94*	*7.11*	*7.19*	*5.64*	*6.81*
Hallmark Cards	7.21	7.73	6.89	5.90	7.31
MTV	7.57	4.80	4.42	4.49	5.13
The Wall Street Journal	6.29	5.51	6.73	5.56	6.89
Gerber Baby Foods	6.19	7.21	6.95	5.81	6.59
Mercedes Benz	6.8	6.02	6.12	5.52	6.96

This study also supports SAM as an easy to use tool for the measurement of brand personality. With its relationship to the widely accepted Goldberg Five-factor model, the scale has a foundation in the currently accepted theory of personality. Because it is a visual and not a verbal measure, the scale can be easily and quickly administered overcoming the inherent fatigue and comprehension problems of longer semantic instruments.

Because the relationship of this visual scale to the Goldberg factors has been established, the scale can also be compared to other widely used measures such as the Adjective Check List (ACL) or the Myers-Briggs Type Indicator (MBTI). Researchers thus have the ability to map the position of brands based on the Goldberg markers and also have the advantage of the different descriptive profiles provided by popular personality profile tests. Maps and quantitative measurements might prove strategically useful while the verbal descriptions might better communicate brand personality to the creative team. As a strategic tool, three dimensional personality maps across brands provides a way to visualize the position of a brand within a product category. Market opportunities can be identified based on unoccupied positions in brand personality space in the same way target markets are now chosen based on differences in consumer demographics and psychographics.

Within a company's product line, similar products can be positioned based on brand personality. Marketers now have a tool capable of visually representing personality space and the position of their products within that space. When planning for new products and brand extensions, marketers have a tool to measure the consistency of the brand personality in different product categories. If the goal is to carry the company's personality into a new category a method is available to verify this has been accomplished. If the goal is to create a new personality for the new category a method now exists to measure this.

It appears this nonverbal personality measurement technique also has value as a diagnostic tool. With the continued emphasis on integrated marketing communications and the importance of a consistent image from all marketing messages, researchers now have a quick and effective way to sample the company image across all facets of corporate communications. Researchers have a method for investigating questions such as, "Is this sales promotion in line with our company image?" or "Does this news release reflect our company personality?"

For comparing advertising executions within a campaign, comparing different advertising campaigns, or ad executions against the brand, marketers have an effective method for measuring the consistency of the personality conveyed by the messages. This nonverbal personality test can be done quickly, with limited respondent fatigue.

With the increased popularity of internet based online surveys and the availability of internet based research panels researchers have an easy rapid way to collect responses over time with the same subjects, providing a way to track changes in brand personality as a result of marketing and advertising efforts. This same method can be used to track changes in brand personality during the product lifecycle. As brands move from the introductory stage to the decline stage brand image changes too. The brand personality component of this image change can be measured and marketing efforts undertaken reposition the brand and perhaps slow the decline of the brand.

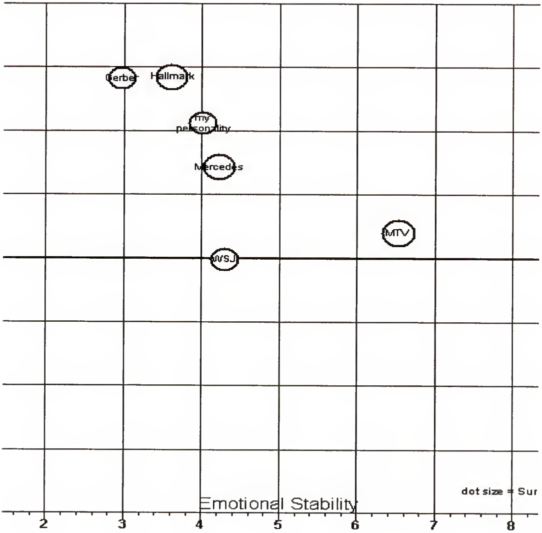

Figure 5 Map Showing Agreeableness, Emotional Stability and Surgency for Brands

The visual nine-point scale allows a variety of statistical tests not available for other personality tests. Means scores can be computed and compared for statistical significance. Using this three dimensional model of personality space, changes in a brand's position can be thought of as distance movement allowing for an interpretation that is more intuitive and easier to understand.

Significance of Findings

The results of this study seem to indicate that consumers use the same concepts and dimensions to assess the personality of brands as they use to appraise the personality of their fellow human beings. This result is supported by the work of Strausbaugh, (1998) but contrary to the finding of Jennifer Aaker (1997). Strausbaugh concluded that the MBTI could be used to measure brand personality; however, Aaker found people used different dimensions to evaluate brands—Sincerity, Excitement, Competence, Sophistication and Ruggedness. If supported through additional research, theories of brand personality could be connected to our understanding of human personality and the vast amount of research that exists on the subject. It would provide the strong theoretical foundation necessary for the development of methods and techniques enabling a more direct comparison of research across studies.

The development of a relatively short semantic test provides a useful tool for marketing research. Based on generally accepted theory this projective test is able to assess the personality of a wide spectrum of brands, it is quick and easy to administer, both the directions and personality descriptors are understandable by the average consumer, the test measures the normal range of personality and it provides a means for interpretation and comparison of test scores.

The development of a nonverbal personality measurement scale has implications for cross-cultural studies, eliminating the problems of translating long questionnaires into foreign languages and difficulty of verifying those translations. Because the scale is based on pictures there is less reliance on language and verbal comprehension. This also has positive implications for use of the instrument with children and less educated respondents.

Measurements of personality are obtained with fewer required responses. This reduces both the cost of testing and the fatigue of the respondents. More items may be measured during a research session. The respondent's interest and attention is maintained and the results more accurately reflect the respondent's beliefs.

Strengths and Weaknesses

Work with semantic scales (Osgood, Suci, & Tannenbaum, 1957; Snider & Osgood, 1969) has exposed pleasure arousal and dominance as components of meaning. Mehrabian (1995) has concluded these three dimensions are basic to all emotional response, and he has theorized a PAD temperament mode that might be inferred to be a middle ground connecting emotion to personality.

A nonverbal instrument, the Self Assessment Manikin, is also available and has been successfully correlated with the semantic differential scales used in emotional response measurement (Morris, Bradley, Sutherland, and Wei, 1993; Morris, Bradley, Lang and Waine 1992; Morris and Waine, 1993).

This study extends the use of the Self Assessment Manikin into the area of personality measurement. Drawing from this theory and prior research showing a strong relationship between the concepts of emotion and personality, the three rows of the SAM scale appear to be a viable device for the measurement of the personality dimensions of

Surgency, Agreeableness and Emotional Stability. However, the scale lacks rows to visually represent the Conscientiousness and Sophistication dimensions of Goldberg's personality model (Goldberg, 1990).

While providing evidence of the link between human personality and the personality of brands, the intent of the Goldberg scale is the measurement of human personality. Extensive research has gone into refining the scale so as to maximize each item's power to describe human personality (Goldberg, 1992). Because of this, individual items may not be the best descriptors of the dimensions as they relate to brands and products.

Limitations

The brands used in this study were chosen because they were considered well-known, widely used, and representative of different product categories. Intuitively, these brands were felt to have very different personalities. No attempt was made at a comprehensive examination of product categories or the brands within any specific category.

The research panel used in this study, although quite large, is skewed older and female, and as such does not mirror the U.S. population. Twenty percent of the sample used for this study was female age 40 to 49 (nationally, the figure is 10.4%). As a market segment, this group may not be equally familiar with each of the brands tested. In fact, the mean brand familiarity for MTV and The Wall Street Journal is significantly different (0.05 level) from Gerber, Hallmark and Mercedes Benz.

Recommendations for Future Research

The current research explored the use of the Self-Assessment Manikin as a tool for the measurement of three out of the five dimensions of personality. A natural extension of this research seems to be the creation and validation of SAM characters to represent the dimensions of Conscientiousness and Intellect. In this same area, a reexploration of the full list of personality adjectives with a focus on brand personality seems to offer the possibility of a scale representing the five dimensions but optimized for products and brands.

With the establishment of a personality construct with dimensions applying to both brands and people, researchers would be able to examine and directly compare the relationships between a consumer's personality and the personality of the brands used. How does brand personality correlate to the consumer's personality for heavy users versus light users? Are there differences according to product category? Are there differences at the more basic demographic levels of gender and age?

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BIOGRAPHICAL SKETCH

James A. Geason was born in Sandusky, Ohio, in 1949. He has a bachelor's degree in journalism from Washington and Lee University in Lexington Virginia. He received his master's degree from the University of Florida. He has owned and managed radio stations and newspapers for over 25 years. He is coauthor of *Developing an Effective Marketing Plan: A Working Guide for Radio Broadcasters*, published by the National Association of Broadcasters. From 1976 to 1982 he was President of Rockbridge Communications, Inc., and General Manager of WWZD-FM. From 1983 to 1993 he was Director and General Manager of WRUF AM/FM, the commercial radio stations at the University of Florida. Since 1993 Geason has been President of Sunesis Marketing Group, Inc. The firm specializes in media management and marketing research. His research interests include the areas of emotional response to advertising and brand personality.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Jon D. Morris, Chair
Professor of Journalism and
Communications

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Joseph R. Pisani

Joseph R. Pisani
Professor of Journalism and
Communications

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Marilyn S Roberts

Marilyn S. Roberts
Professor of Journalism and
Communications

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

M. David Miller

M. David Miller
Professor of Educational Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Robert Ziller
Professor of Psychology

This dissertation was submitted to the Graduate Faculty of the College of Journalism and Communications and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 2002

Terry Hynes

Dean, College of Journalism and
Communications

Dean, Graduate School